CLIMATOLOGICAL REFERENCE STATION
SASKATOON
ANNUAL SUMMARY
2007

C. Beaulieu
V. Wittrock
Saskatchewan Research Council
Environment and Forestry Division

SRC Publication No. 10440 - 1E08

February 2008

SRC
smart science solutions

Saskatchewan Research Council

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Enquiries concerning the SRC Climatological Reference Station (CRS), its data, measurement programs and publications, or becoming a sponsor are most welcome. For further information contact:

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COVER PHOTOGRAPHS
Sunflowers
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TABLE OF CONTENTS

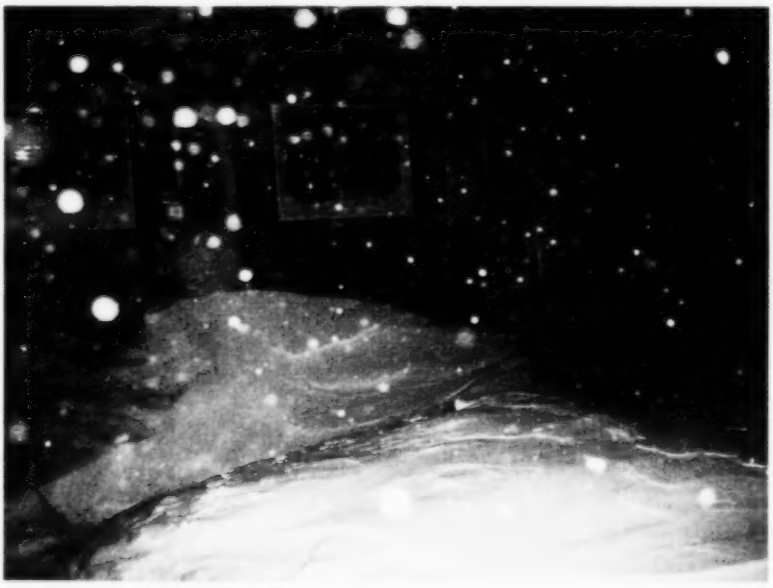
Acknowledgements . . . 2
Climate Reference Station sponsors, 2007 . . . 2
Table of Contents . . . 3
Climate Reference Station History . . . 4
What is the Climate Reference Station? . . . 5
Activities at the Climate Reference Station, 2007 . . . 6
Summaries for 2007
Overview . . . 7
Weather events summaries, 2007
Temperature rankings . . . 8
Dates and duration of the frost-free season . . . 8
New 2007 records . . . 9
Extreme daily winds for 2007 . . . 9
Extreme temperatures for 2007 . . . 9
Annual and seasonal precipitation rankings . . . 10
Extreme precipitation events . . . 10
Ranking of monthly precipitation . . . 10
SRC Climate Reference Station daily temperature record for 2007 . . . 11
SRC Climate Reference Station daily precipitation record for 2007 . . . 12
Monthly summaries - tables and graphs
Monthly temperatures and extreme values for 2007 and annual temperatures (1964-2006) . . . 13
Monthly precipitation and extreme values for 2007 and total annual precipitation (1964-2006) . . . 14
Monthly heating and cooling degree-days, 2007 . . . 15
Monthly growing degree-days, 2007 . . . 16
Potential evapotransporition (PE) using the Thornthwaite Method . . . 16
Sunrise and sunset at Saskatoon, 2007 and 2008 . . . 17
Bright sunshine for 2007 and annual trend . . . 18
Global and diffuse solar radiation, 2007 . . . 19
Monthly average soil temperatures, 2007 . . . 20
Monthly wind speeds, 2007 . . . 21
Windchill calculation chart . . . 21
Annual weather summary of elements . . . 22
Monthly weather summaries of elements . . . 23
Instruments used at Saskatoon SRC CRS and Glossary of Terms . . . 35
References and Bibliography . . . 38

CLIMATE REFERENCE STATION HISTORY

Meteorological observations at or near Saskatoon were first taken by the Royal Northwest Mounted Police in 1889 with the recording of temperature. There is some disagreement in the early records as to the exact location of the weather observing point, but the majority of the evidence indicates 52°15'N, 106°20'W, elevation 480m above sea level as the most probable location. This would place it at Clark's Crossing on the South Saskatchewan River, approximately 16 km northeast of the centre of the City of Saskatoon. At that time, there was a settlement at Clark's Crossing as well as 10 to 15 families on either side of the river where Saskatoon is now located.

Little is known about the very early observers; however, the records do show that Major T.H. Keenan took observations from March 1892 until March 1895, and Mr. George Will was the observer from January 1897 until April 1897. It is thought that T. H. Copeland was involved in the observational programme from 1895 to May 1, 1901, at which time it was taken over by Mr. Eby, Sr. Mr. Eby, Sr. recorded the observations until his death in 1921, at which time his daughter, Miss E.S. Eby, continued to record the observations. Her brother, Mr. J.M. Eby, recorded the observations beginning in April 1931 until the station was closed October 31, 1942. The Eby station recorded temperature, precipitation and weather notes on fog, thunderstorms, winds and any unusual weather phenomena. Reports were made twice daily, morning and evening.

In 1916, a climatological station was established by the Physics Department of the University of Saskatchewan and continuous observations were kept twice daily until January 15, 1965. The longtime observer was Mr. Sidney Cox. The Saskatchewan Research Council took over the programme in the fall of 1963 at the newly established Climatological Reference Station at latitude 52°09'N, longitude 106°36'W and elevation 497 m asl[1]. The first observer was Terry Beck followed three years later by Orville Olm.[2] In 1967, Joe Calvert became the primary observer until his retirement in 1983. Ray Begrand succeeded Mr. Calvert until 1988 when Virginia Wittrock became the primary observer. Since 1992, the primary observer has been Carol Beaulieu assisted by Virginia Wittrock.



January 10th blizzard photo credit S. Mamer

In the summer of 1992, the CRS began to be converted to an automated system of data collection with the installation of a Campbell Scientific data logger and automatic sensors. Elements presently recorded at the site are temperature, precipitation, wind, solar radiation, relative humidity, barometric pressure, soil temperature and snow-on-the-ground (manual recordings). Temperature, precipitation and bright shunshine data are submitted to Environment Canada.

[1] *Christiansen 1970; Environment Canada 1975*
[2] *Olm 2001*

WHAT IS THE CLIMATE REFERENCE STATION?

The Saskatchewan Research Council's Climate Reference Station (SRC CRS) at Saskatoon is classified as a principal climatological station with supplementary climatological observations.[1] A reference climatological station's data are intended for the purpose of determining climatic trends. This requires long periods (not less than thirty years) of homogeneous records, where man-made environmental changes have been or are expected to remain at a minimum. Ideally the records should be of sufficient length to enable the identification of secular changes of climate[2]. At our station, hourly readings are taken of elements which include temperature, precipitation amount, humidity, wind, and atmospheric pressure. Our supplemental observations include rate of rainfall, soil temperature, bright sunshine and solar radiation. High quality and consistent climatological observations are maintained providing data sets to meet the current concerns of the effects of climatic change and increased variability.

Belfort Precipitation Gauge after the January 2007 blizzard photo credit: CR Beaulieu

Purpose and Benefits

The purpose of the SRC CRS is to provide a record of observed meteorological elements so that the climate of the area and its changes can be accurately documented and described. Climatological data have assumed new importance as a result of social and environmental issues in which climate is a dominant factor. Climatological information assists in realizing new technological opportunities and social changes. It is necessary and valuable for areas such as agriculture, forestry, land use and facility placement, water and energy resources, health and comfort.

The CRS also allows us to:

- evaluate long term climate trends - early warning system for increased frequencies of extreme events such as drought, floods, *etc.;*
- determine the impacts of climate events on society, economy, health, and ecosystems - *e.g.* intense rainfall causing flooding and property damage, heat stress with its implications for health;
- do value-added research;
- be part of regional, national and global networks in an important agricultural and ecological area;
- facilitate development of additional programs - *e.g.* air quality, biodiversity, and climate change monitoring;
- have roles in various programs within SRC including spray drift work, Boreal Ecosystem Atmosphere Study (BOREAS), and collaborative research with the Western College of Veterinary Medicine and the College of Agriculture, University of Saskatchewan, for example; and
- provide climate data to governments, universities, insurance agencies, lawyers, agricultural sectors, chemical companies, schools, building science, construction firms, media, transportation studies, accident studies, wildlife studies, tourism groups and interested individuals.

Goals

The goals of the Climate Reference Station are first, to maintain the high quality of data gathered over its more than forty years of existence at its current location and, second, to continue to monitor a large variety of elements. These various elements combined with the long-term collection period as well as the stable location allow CRS to be a very valuable climate information collection station.

[1] *Environment Canada 1992*
[2] *World Meteorological Organization 1988*

ACTIVITIES AT THE CLIMATE REFERENCE STATION, 2007

This year the SPLIT programme (Schools Plant Legacy in Trees) once again requested a presentation on climate for their participants. This programme, sponsored by various community partners including the City of Saskatoon and the Kiwanis Club of Riversdale, is where students take a leadership role in developing a more natural landscape around their schools and learn many valuable lessons about the role forests and trees have in their daily lives. Approximately 100 students received hands-on experience with the weather instruments used to measure temperature, precipitation, wind and solar radiation. The computer presentation highlighted Saskatoon's climate; past, present and future and why consideration of the climate is necessary for the planning of the urban landscape.

CRS continued to host the Sonic Detection and Ranging (SODAR) system during 2007. SODAR isused to remotely measure the vertical turbulence structure and wind profile of the lower layer of the atmosphere with sound. It can also measure wind speed, wind direction and turbulent characteristics between 20 and 200m without the necessity of erecting a high tower.

CRS was also host for SRC Air Quality's TEOM® Ambient Particulate (PM-10) Monitor. This instrument measures Saskatoon's air pollution from dust and other particulates down to 10 microns.

SODAR on the CRS bunker after the January 2007 blizzard photo credit CR Beaulieu

SUMMARIES FOR 2007

Overview

Data concerning temperature, precipitation, wind speed and direction, bright sunshine, solar radiation, and soil temperatures, recorded at the Saskatchewan Research Council (SRC) Climatological Reference Station (CRS) (52°09'N, 106°36'W, 497 m asl), are presented for the year 2007 and compared with the long-term (*circa* 1900-2006) and standard-period/normal (1971-2000) records.

After a December that left only 19cm of snow on the ground, January 2007 began with a false sense of *we-are-through-the-worse*. Then, on the 10th, an old fashioned blizzard of tall-tale magnitude hit and buried Saskatoon. With 35.2mm recorded, it became the greatest precipitation for a January day since 1964 which was the first January CRS was in operation. Overall, 2007, was the 10th wettest year and the 4th consecutive year with above normal precipitation since 1963. This is in spite of only five months having greater than average precipitation and April having record low precipitation. Over half of the annual precipitation occurred during June and August when 109.4mm and 105.2mm were measured respectively. Winter (December, January, February) ranked as the 4th wettest and summer (June, July, August) as the 5th wettest. Autumn, while the 6th driest at CRS, had the 2nd most precipitation days for the season. Daily precipitation, greater than 25mm, occurred thrice during the year: January 10th, August 17th and August 19th. The August 17th downpour garnered the record for the most precipitation for an August day at CRS. Five other daily precipitation records were surpassed including the June 17th 2006 daily record of 35.0mm. Precipitation this June 17th was 68.0mm.

July and August of 2007 will be remembered as "*Grill and Chill*". In July, ten days had over 30°C temperatures of which six were over 32°C and of those six, two were over 35°C. This caused people to head for basements and air-conditioned buildings. The highest average July maximum and minimum temperatures were established in addition to tying the 2002 highest average monthly mean temperature. July also had the highest number of days over 32°C recorded at CRS plus the greatest number growing and cooling degree-days. It was due to July's cooling degree-days, three times its normal, that the annual total was over 46% of its normal. The sums for the other months were all below normal values. July's degree-day total for extreme cooling, by itself, was over twice the normal value for the year. Even though July was uncomfortably hot, only from the 27th to the 30th could be considered as a heat wave.

August, by contrast, had below normal temperatures for the monthly maximum and mean values. Heating degree-days were 22% higher than normal while the cooling degree days were 30% below normal. Only three days had temperatures over 30°C. Eleven daily maximum temperatures rose only to the 'teens' while daily minimum temperatures fell to the single digits fourteen times.

Overall, 2007 tied as the 12th warmest year out of the last forty-four. The annual minimum average was the 8th warmest at -2.2°C and the maximum average tied for the 17th warmest. The maximum monthly average was greater than normal for five months while the minimum monthly average was greater than normal for nine months. 2007 had four new daily maximum temperature values established while no new record minimum values were recorded.

Annual bright sunshine values were 11.3% above normal. Only August and December registered hours below their normal values. Annual bright sunshine days followed the same pattern with nine out of twelve months recording total days above normal. July was just 2½ hours short of 1966 (386.2 hours) for the highest monthly total of bright sunshine hours. This near record is reflected as spikes in July's diffuse and global solar radiation graphs.

Wind speeds, greater than 51km/h, occurred on 45 days during the year. Gale winds (63-75 km/h) occurred seven times while Strong Gale winds (76-87 km/h) occurred twice; both in July. Near Gale winds (51-62km/h) began in the early evening of January 9th, increased in speed to 73 km/h during the afternoon of the January 10th blizzard and then decreased back to Near Gale winds in the early morning of January 11th. Coupled with the record snow fall, the winds created dangerous conditions within Saskatoon. High windchill values, zero visibility and massive snowdrifts clogged city streets and halted all traffic but the most determined individuals.

Weather Events Summaries, 2006

TEMPERATURE RANKINGS
1964 to Present

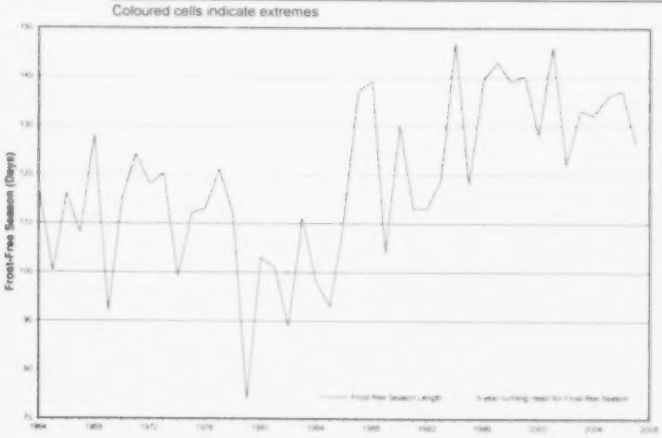
WARMEST ANNUAL MAXIMUM TEMPERATURE °C		COLDEST ANNUAL MINIMUM TEMPERATURE °C		WARMEST ANNUAL AVERAGE TEMPERATURE °C		RANK-ING
1987	11.6	1966	-5.5	1987	5.4	1
2001	10.8	1979	-5.3	2001	4.6	2
1981	10.5	1982	-5.3	1981	4.5	3
1988	10.1	1965	-5.3	1998	4.3	4
1998	10.1	1996	-5.2	1999	4.2	5
1999	9.8	1975	-5.1	2006	4.2	6
2006	9.6	1972	-4.8	1988	3.9	7
1976	9.5	1985	-4.8	2005	3.8	8
1997	9.5	1967	-4.7	1997	3.5	9
2003	9.3	1974	-4.7	2003	3.4	10
2005	9.1	1971	-4.6	1991	3.2	11
1986	9.0	1969	-4.6	1986	3.2	12
1991	8.9	1978	-4.6	2007	3.2	13
2000	8.8	1970	-4.0	1976	3.0	14
1984	8.7	1973	-4.0	1992	3.0	15
1990	8.7	1980	-3.8	2000	3.0	16
1977	8.6	1989	-3.8	1984	2.9	17
1980	8.6	1977	-3.6	1993	2.8	18
2007	8.6	1990	-3.6	2004	2.8	19
1992	8.5	1976	-3.5	2002	2.8	20
2002	8.5	1968	-3.4	1964	2.7	21
1994	8.5	1995	-3.4	1994	2.7	22
2004	8.4	1983	-3.2	1990	2.6	23
1989	8.3	1994	-3.2	1977	2.5	24
1964	8.2	1964	-2.9	1980	2.4	25
1993	8.1	2000	-2.9	1989	2.3	26
1995	7.9	1984	-2.9	1995	2.3	27
1973	7.8	2002	-2.9	1983	2.2	28
1968	7.7	2004	-2.8	1968	2.2	29
1983	7.7	1986	-2.6	1973	1.9	30
1978	7.4	1992	-2.5	1970	1.7	31
1970	7.3	1991	-2.5	1978	1.4	32
1974	7.1	1993	-2.5	1971	1.2	33
1971	7.1	2003	-2.5	1974	1.2	34
1967	7.0	1997	-2.4	1967	1.1	35
1985	6.9	1988	-2.3	1969	1.1	36
1975	6.9	2007	-2.2	1985	1.1	37
1969	6.8	2001	-1.6	1975	0.9	38
1979	6.5	2005	-1.6	1972	0.6	39
1966	6.4	1998	-1.5	1979	0.6	40
1965	6.3	1981	-1.5	1965	0.5	41
1982	6.2	1999	-1.4	1966	0.4	42
1996	6.1	2006	-1.3	1996	0.4	43
1972	6.1	1987	-0.8	1982	0.4	44

DATES AND DURATION OF THE FROST-FREE SEASON
1964 to Present

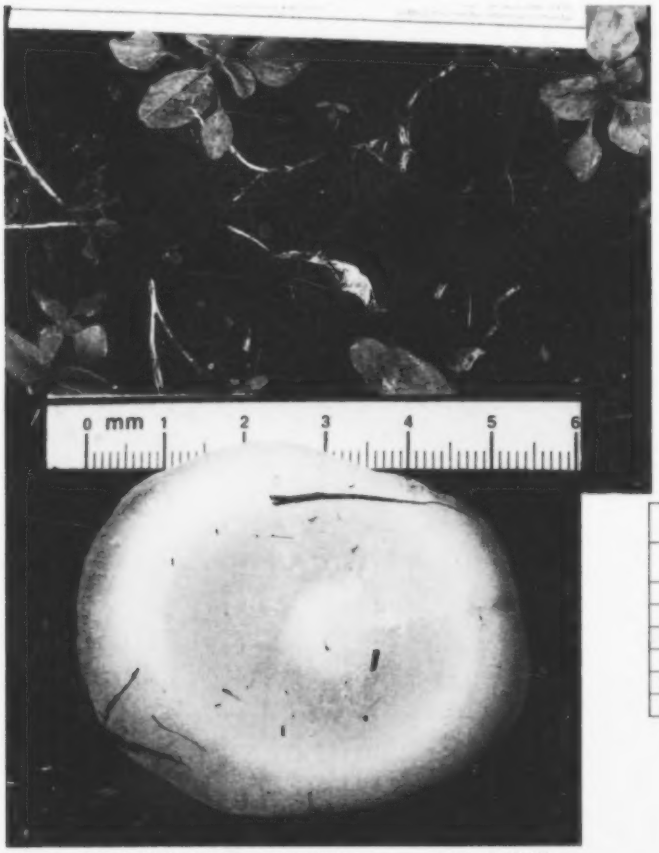
YEAR	DATE OF LAST SPRING FROST	DATE OF FIRST FALL FROST	LENGTH OF SEASON (days)
1964	May 31	Sept 26	117
1965	May 27	Sept 05	100
1966	May 19	Sept 13	116
1967	Jun 06	Sept 23	108
1968	May 19	Sept 15	128
1969	Jun 14	Sept 25	92
1970	May 19	Sept 12	124
1971	May 18	Sept 20	115
1972	May 08	Sept 04	118
1973	May 06	Sept 14	120
1974	May 25	Sept 02	99
1975	May 21	Sept 11	112
1976	May 06	Aug 28	113
1977	May 01	Aug 31	121
1978	May 30	Sept 30	112
1979	May 30	Aug 13	74
1980	May 14	Aug 26	103
1981	May 24	Sept 03	101
1982	May 29	Aug 27	89
1983	May 24	Sept 13	111
1984	May 24	Aug 31	98
1985	Jun 04	Sept 06	93
1986	May 17	Sept 06	111
1987	May 21	Oct 06	137
1988	May 02	Sept 19	139
1989	May 28	Sept 10	104
1990	May 13	Sept 21	130
1991	May 27	Sept 18	113
1992	May 23	Sept 14	113
1993	May 17	Sept 14	119
1994	May 09	Oct 04	147
1995	May 22	Sept 18	118
1996	May 12	Sept 29	139
1997	May 14	Oct 05	143
1998	May 13	Sept 30	139
1999	May 09	Sept 27	140
2000	May 17	Sept 23	128
2001	May 10	Oct 04	148
2002	May 23	Sept 23	122
2003	May 18	Sept 29	133
2004	May 20	Sept 30	132
2005	May 14	Sept 28	136
2006	May 04	Sept 19	137
2007	May 10	Sept 14	126
1971-2000 Normal	May 18	Sept 14	117

Coloured cells indicate extremes

Hoar Frost on the Diffuse Pyranometer *photo credit: CR Beaulieu*



NEW 2007 RECORDS			
TYPE	DATE	NEW RECORD	OLD RECORD/ year
Daily Maximum Temperature (°C)	January 2	5.2	2.2/1964
	April 14	21.0	21.0/1987
	July 23	37.1	33.2/2006
	July 30	36.3	33.0/1988 & 1989
Highest Average Monthly Maximum Temperature (C°)	July	28.5	27.9/1984
Highest Average Monthly Minimum Temperature (C)	July	15.0	14.3/2006
Highest Number of Days with Temperature >=32°C	July	6	6/ 2002
Highest Monthly Mean Temperature (°C)	July	21.8	21.0/2006
Highest Monthly Growing Degree-days (18°C)	July	519.5	495.1/2006
Highest Monthly Cooling Degree-days (24°C)	July	125.6	109.9/2002
Maximum Daily Precipitation (mm)	January 10	35.2	4.1/1980
	February 1	2.9	2.3/1990
	February 23	6.7	3.0/1994
	March 28	8.1	3.0/1997
	June 17	68.0	35.0/2006
	August 17	48.2	33.8/1998
Highest Daily Maximum Precipitation for the Month	January 10	35.2	15.4/30/1989
	August 17	48.2	33.8/17/1998
Lowest Monthly Precipitation (mm)	April	2.4	3.5/1988 & 1989
Monthly Precipitation Days > 25 mm	January	1	0
	August	2	1



Holes caused from the July 2007 Hail storm, south of Saskatoon *photo credit: EE Wheaton*

EXTREME DAILY WINDS FOR 2007 (km/h)		
DATE	WIND SPEED/ DIRECTION	BEAUFORT WIND SCALE DESIGNATION*
January 10	73.6^{NE}	Gale
January 11	57.2^{N}	Near Gale
January 28	56.3^{W}	Near Gale
January 30	51.1^{NNE}	Near Gale
January 31	63.0^{N}	Gale
February 1	56.9^{N}	Near Gale
February 23	52.1^{ESE}	Near Gale
March 27	54.8^{E}	Near Gale
April 18	56.0^{E}	Near Gale
April19	59.4^{NW}	Near Gale
April 28	58.9^{NW}	Near Gale
May 2	57.7^{SSE}	Near Gale
May 4	54.7^{SW}	Near Gale
May 7	51.5^{NW}	Near Gale
May 9	58.6^{NW}	Near Gale
May 12	71.2^{NW}	Gale
May 18	62.0^{NE}	Strong Gale
May 23	52.4^{NE}	Near Gale
May 29	52.5^{NNE}	Near Gale
June 5	55.3^{NE}	Near Gale
June 12	57.1^{WSW}	Near Gale
June 13	53.2^{W}	Near Gale
June 17	53.6^{ENE}	Near Gale
June 18	72.7^{N}	Gale
June 19	56.1^{NW}	Near Gale
June 25	54.5^{WSW}	Near Gale
June 30	63.6^{ESE}	Gale
July 7	78.2^{W}	Strong Gale
July 15	51.4^{N}	Near Gale
July 20	68.9^{WSW}	Gale
August 17	56.5^{ESE}	Near Gale
August 18	51.4^{SSE}	Near Gale
August 19	56.5^{W}	Near Gale
August 20	60.4^{W}	Near Gale
August 21	56.5^{W}	Near Gale
September 1	55.0^{NW}	Near Gale
September 26	60.0^{NW}	Near Gale
October 10	52.9^{ESE}	Near Gale
October 25	56.9^{WNW}	Near Gale
October 30	56.7^{NW}	Near Gale
November 1	53.9^{NW}	Near Gale
Novermber 8	57.7^{NW}	Near Gale
November 11	63.0^{NW}	Gale
November 12	51.5^{NW}	Near Gale
November 13	68.4^{WNW}	Gale

*Near Gale >=51 but < 63 *Gale >=63 but <76
*Strong Gale >=76 but <88 *Storm >=88 but <102

EXTREME TEMPERATURES FOR 2007			
COLD SPELL (less than or equal to -30°C)		HOT SPELL (greater than or equal to 30°C)	
DATE	TEMPERATURE °C	DATE	TEMPERATURE °C
January 11	-31.1	July 5	30.7
January 12	-31.2	July 6	31.2
January 14	-30.5	July 13	30.1
February 12	-31.1	July 22	32.1
February 14	-31.1	July 23	37.1
		July 24	31.9
		July 27	33.4
		July 28	33.6
		July 29	34.3
		July 30	36.3
		August 3	32.0
		August 7	33.3
		August 31	33.0

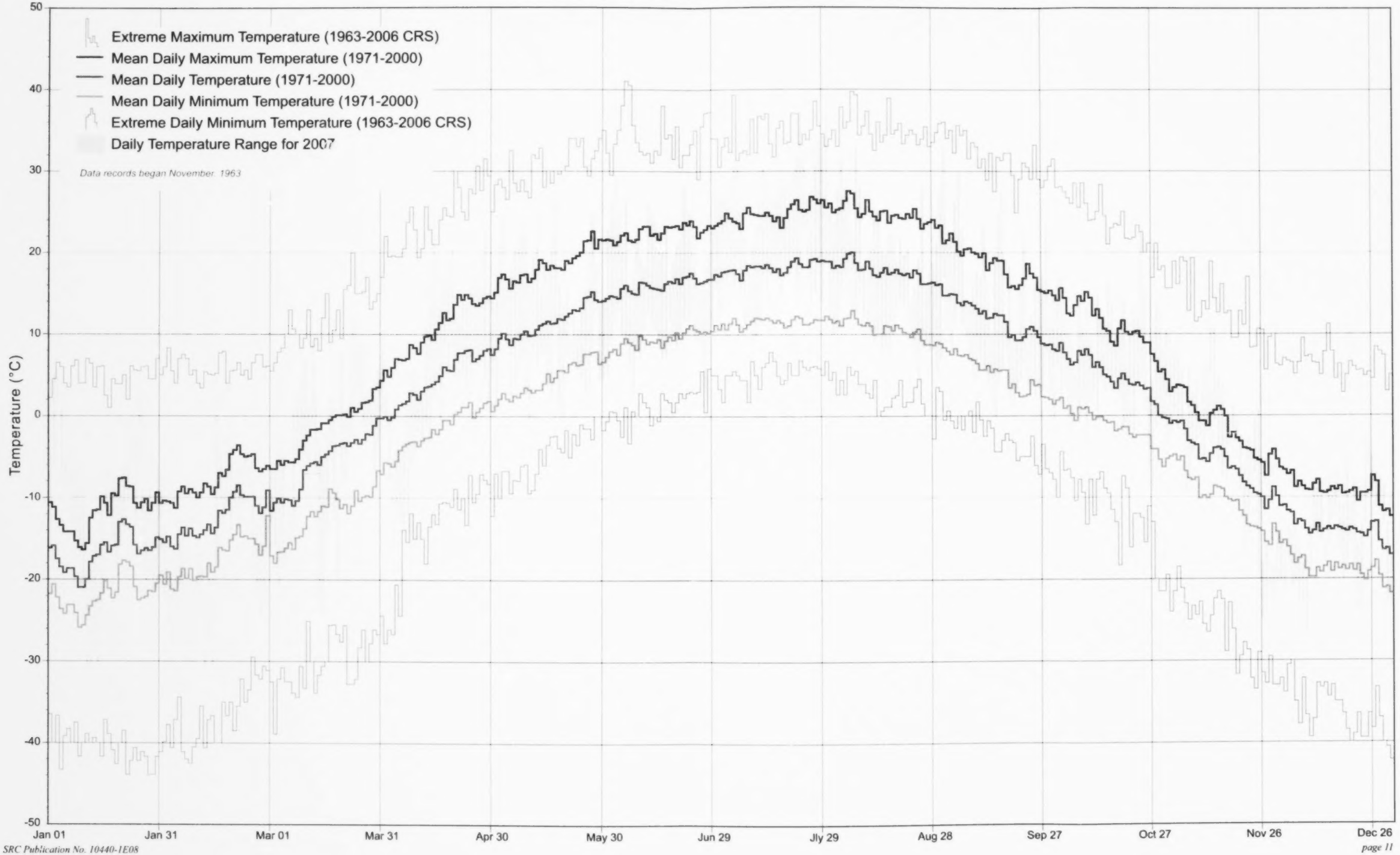
ANNUAL AND SEASONAL PRECIPITATION RANKINGS										
DRIEST YEARS (mm)		DRIEST WINTER (Dec. Jan. Feb.) (mm)		DRIEST SPRING (Mar. Apr. May) (mm)		DRIEST SUMMER (Jun. Jly. Aug.) (mm)		DRIEST AUTUMN (Sep. Oct. Nov.) (mm)		RANKING
2001	165.8	2002	12.1	2002	20.3	1984	70.2	1999	17.2	1
1987	232.4	1984	19.2	1998	29.8	1964	73.9	1994	21.0	2
2003	257.7	1993	22.0	2001	34.0	1977	81.9	1976	21.8	3
1998	263.3	1998	22.4	1980	42.2	2001	91.2	1987	27.4	4
1981	279.8	2001	23.1	1965	43.2	1985	91.8	2001	28.5	5
1964	282.7	2003	29.2	1981	54.3	1987	92.6	2007	30.8	6
1988	285.7	2004	29.3	2004	55.4	1969	105.5	2000	31.2	7
1992	288.1	1987	30.6	1992	55.5	1992	115.6	1972	32.3	8
1997	291.4	1995	31.3	1988	55.6	1997	116.4	1990	33.9	9
1984	293.1	1999	31.3	1999	56.5	1980	120.3	1971	34.2	10
1999	297.7	2000	31.7	1984	57.2	1981	124.9	1988	38.1	11
1993	300.0	2006	32.0	1996	58.8	2003	126.2	1974	40.0	12
1980	305.9	1988	35.9	2000	59.2	1972	133.3	1975	48.8	13
1990	309.8	1982	37.0	1971	61.1	1998	133.4	2004	50.0	14
2000	315.4	1967	37.9	1966	61.2	1979	135.9	1966	50.2	15
1972	317.9	1991	40.3	2003	61.8	1967	139.9	1965	50.9	16
2002	320.0	1983	41.1	2005	62.1	1978	142.5	2003	51.2	17
1995	327.7	1977	43.1	1993	62.2	1975	144.5	1995	52.6	18
1985	330.6	1994	45.1	2007	64.7	1990	144.5	1979	53.4	19
1976	331.8	2005	45.4	1995	65.4	1988	148.9	1985	55.2	20
1996	340.6	1964	47.9	1970	65.7	1989	149.9	1970	56.4	21
1994	341.4	1997	48.0	1964	65.8	1993	151.0	1981	61.4	22
1979	352.0	1996	51.0	1969	68.5	1996	154.4	1997	61.6	23
1967	354.3	1981	52.2	1976	69.1	1973	156.1	1989	64.5	24
1978	358.1	1985	52.3	1972	71.6	1995	164.4	1977	65.4	25
1965	358.8	1970	52.7	1978	72.8	1994	165.6	1992	65.9	26
1977	370.5	1968	53.8	1973	73.1	1976	169.4	1980	66.6	27
1966	376.9	1966	54.7	1987	73.6	2000	183.8	1998	70.0	28
1989	384.8	1992	55.0	1967	78.0	2006	183.8	1968	71.3	29
1970	388.8	1990	55.6	1986	82.5	1999	194.2	2002	72.8	30
1975	392.3	1986	57.2	1990	87.2	1986	196.2	1993	73.1	31
1973	393.3	1989	57.9	1979	87.3	1974	205.5	1996	74.4	32
2004	404.5	1971	60.4	1997	88.2	1965	206.6	1967	76.8	33
1986	411.3	1979	61.3	1968	97.6	2002	206.8	1964	77.4	34
2007	413.9	1978	63.0	1989	101.7	1982	208.4	1982	81.5	35
1971	414.6	1973	63.2	2006	101.8	1983	215.8	1986	87.2	36
1969	427.4	1975	67.3	1994	109.4	1970	216.5	1973	88.2	37
1982	436.2	1965	69.3	1982	110.8	1966	222.0	1983	96.2	38
1968	443.1	1976	69.5	1975	119.6	1968	225.9	1991	105.4	39
1974	462.7	1980	73.0	1983	125.2	2007	231.0	2005	109.4	40
1983	471.6	2007	74.7	1985	134.3	1971	248.8	1978	111.4	41
2005	486.8	1972	92.2	1991	147.3	1991	251.6	1984	137.0	42
2006	517.5	1974	92.2	1974	148.0	2004	260.0	1969	151.8	43
1991	546.9	1969	98.1	1977	164.1	2005	269.4	2006	203.3	44

EXTREME PRECIPITATION EVENTS (mm)*		
PERIOD	DATE	AMOUNT
0.5 hour	August 17	16.2
0.5 hour	July 09	6.8
1 hour	August 17	28.8
1 hour	June 17	10.0
2 hours	August 17	35.8
2 hours	June 17	17.8
6 hours	August 17	47.8
6 hours	June 17	35.6
12 hours	June 17	60.0
12 hours	August 17	48.2
Daily	June 17	68.0
Daily	August 17	48.2
Daily	January 10	35.2 (blizzard)

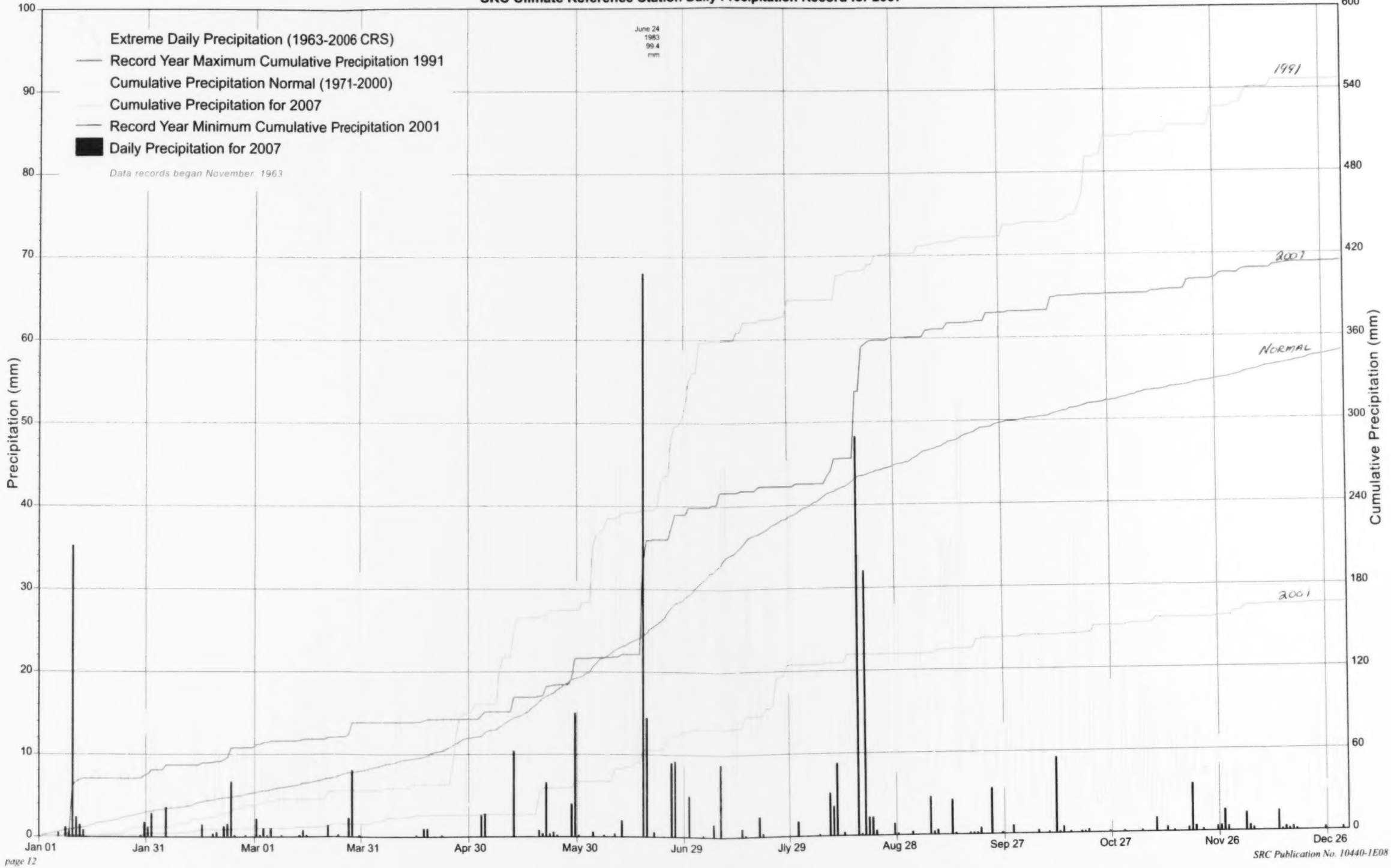
**recorded by tipping bucket April 16th to October 31st*

DRIEST MONTH BY % OF NORMAL PRECIPITATION		RANKING	DRIEST MONTH BY PRECIPITATION AMOUNT (mm)	
April	10.2	1	April	2.4
July	28.3	2	December	8.2
December	44.8	3	October	12.2
September	63.3	4	November	14.5
October	74.4	5	July	16.4
November	98.0	6	March	18.3
May	99.3	7	September	18.6
Mar	113.0	8	February	19.0
February	142.9	9	May	44.0
June	183.9	10	January	45.7
January	251.1	11	August	105.2
August	290.6	12	June	109.4

SRC Climate Reference Station Daily Temperature Record for 2007

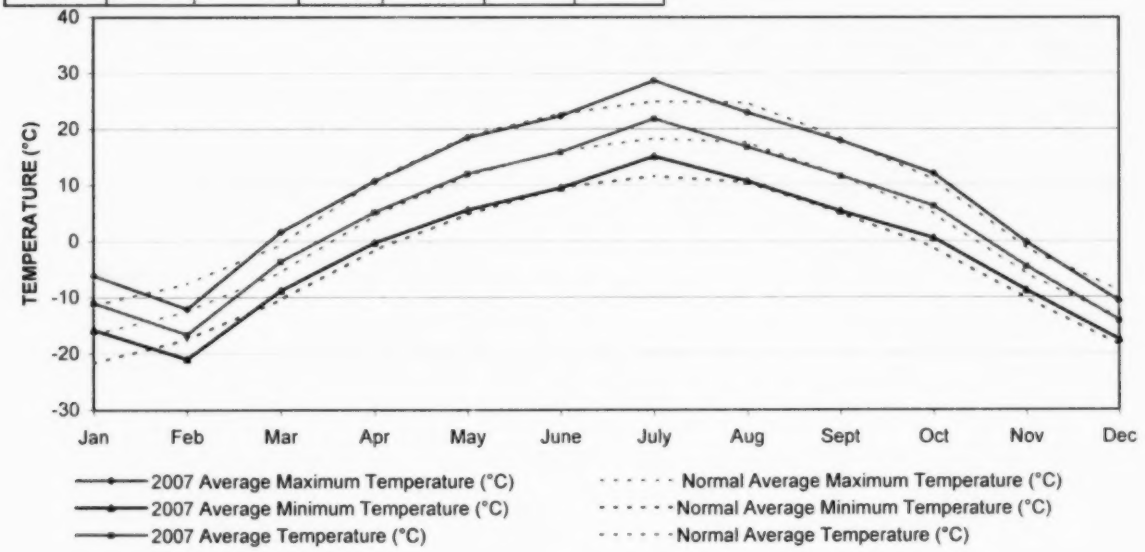


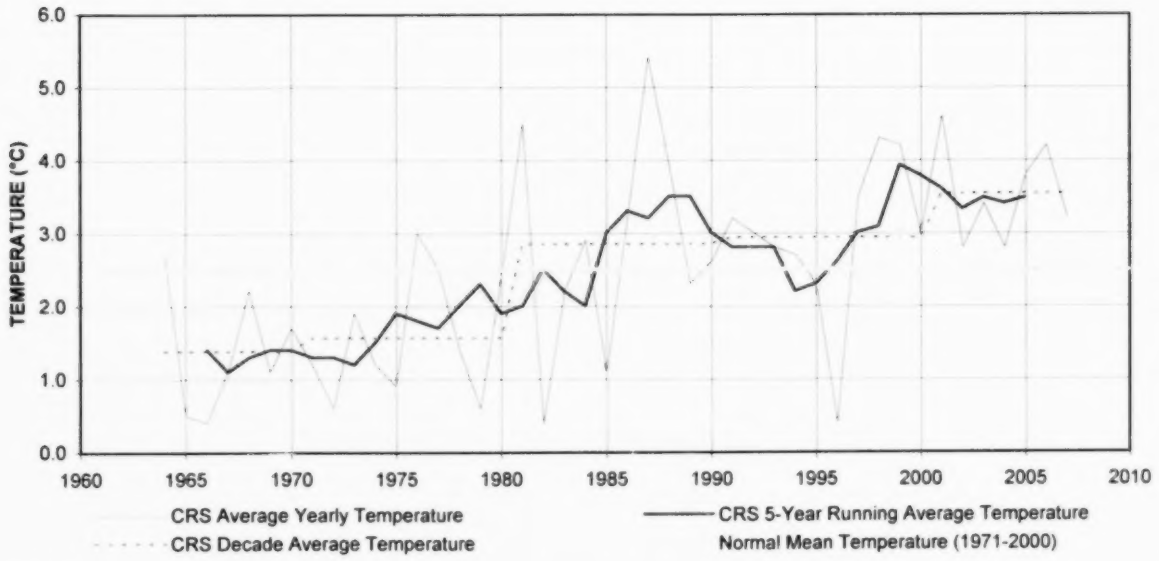
SRC Climate Reference Station Daily Precipitation Record for 2007



Monthly Temperatures and Extreme Values for 2007 and Annual Temperatures (1964-2007)

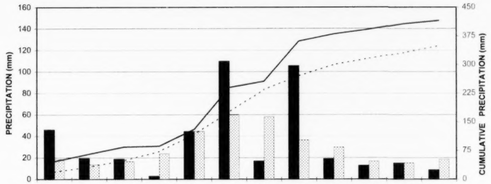
MONTH	AVERAGE MAXIMUM TEMPERATURE (°C)		AVERAGE MINIMUM TEMPERATURE (°C)		AVERAGE TEMPERATURE (°C)		EXTREME VALUES TEMPERATURE (°C)		EXTREME VALUES FOR SASKATOON STATIONS	
	2007	Normal	2007	Normal	2007	Normal	Maximum/Date	Minimum/Date	Maximum/Date	Minimum/Date
January	-6.3	-11.6	-15.9	-21.8	-11.1	-16.7	5.2/02	-31.2/12	11.0/1980/23	-48.9/1893/31
February	-12.3	-7.7	-21.1	-17.6	-16.7	-12.6	0.2/15	-31.1/12&14	12.8/1931/19	-50.0/1893/01
March	1.5	-0.7	-8.9	-10.5	-3.7	-5.6	12.2/23	-24.4/15	22.8/1910/23	-43.3/1897/14
April	10.5	10.7	-0.4	-1.7	5.0	4.5	22.7/28	-13.4/06	33.3/1952/28	-30.5/1979/01
May	18.3	18.6	5.5	4.7	11.9	11.6	26.5/17	-0.6/10	37.2/1936/27	-12.8/1907/06
June	22.2	22.6	9.4	9.5	15.8	16.0	29.5/02	2.7/07	41.0/19[illegible]3/06	-3.9/1917/02
July	28.5	24.8	15.0	11.5	21.8	18.2	37.1/23	8.7/10	40.0/1919,1941,1948	-0.6/1918/25
August	22.7	24.6	10.6	10.4	16.7	17.5	33.3/07	4.7/24	39.7/1998/06	-2.8/1901/23&1976/28
September	17.8	18.1	5.2	4.9	11.5	11.6	29.9/04	-2.2/30	35.6/1978/04	-11.1/1908/28
October	11.9	10.8	0.4	-1.3	6.2	4.8	22.4/24	-9.2/27	32.2/1943/05	-25.6/1919/26
November	-0.3	-1.4	-8.9	-10.3	-4.6	-5.9	11.3/12	-24.9/26	21.7/1903/03	-39.4/1893/30
December	-10.9	-9.0	-17.7	-18.6	-14.3	-13.9	-2.1/24	-26.8/08	14.4/1939/05	-43.9/1892/22
Average	8.6	8.3	-2.2	-3.4	3.2	2.5				





Monthly Precipitation and Extreme Values for 2007 and Total Annual Precipitation (1964-2007)

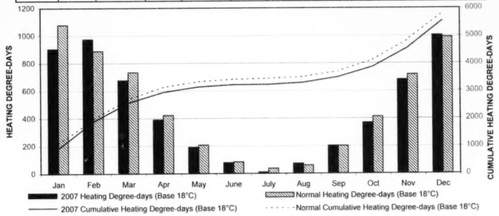
MONTH	PRECIPITATION (mm)			CUMULATIVE PRECIPITATION (mm)			EXTREME DAILY PRECIPITATION (mm)
	2007	Normal	% of Normal	2007	Normal	% of Normal	Maximum/Date
January	45.7	18.2	251.1	45.7	18.2	251.1	35.2/10
February	19.0	13.3	142.9	64.7	31.5	205.4	6.7/23
March	18.3	16.2	113.0	83.0	47.7	174.0	8.1/28
April	2.4	23.6	10.2	85.4	71.3	119.8	1.0/17,&18
May	44.0	44.3	99.3	129.4	115.6	111.9	15.0/29
June	109.4	59.5	183.9	238.8	175.1	136.4	68.0/17
July	16.4	58.0	28.3	255.2	233.1	109.5	8.4/26
August	105.2	36.2	290.6	360.4	269.3	133.8	46.2/17
September	18.6	29.4	63.3	379.0	298.7	126.9	5.6/23
October	12.2	16.4	74.4	391.2	315.1	124.2	5.2/11
November	14.5	14.8	98.0	405.7	329.9	123.0	5.8/18
December	8.2	18.3	44.8	413.9	348.2	118.9	2.4/12
Total	413.9	348.2	118.9				

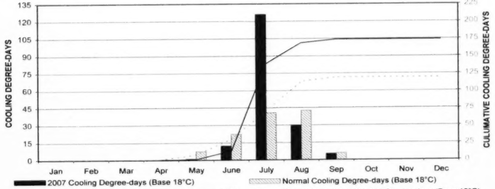

PRECIPITATION (mm)
CUMULATIVE PRECIPITATION (mm)
Jan Feb Mar Apr May June July Aug Sep Oct Nov Dec
2007 Precipitation (mm)
Normal Precipitation (mm)
2007 Cumulative Precipitation (mm)
Normal Cumulative Precipitation (mm)

PRECIPITATION (mm)
1960 1965 1970 1975 1980 1985 1990 1995 2000 2005 2010
CRS Total Yearly Precipitation
CRS 5-Year Running Average Precipitation
CRS Decade Average Precipitation
Normal Mean Precipitation (1971-2000)

Monthly Heating and Cooling Degree-days, 2007

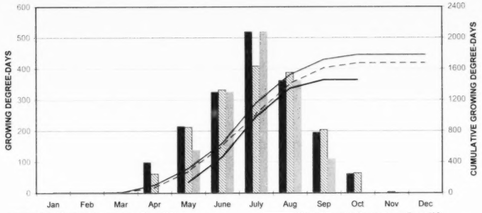
MONTH	HEATING DEGREE-DAYS Base 18°C		CUMULATIVE HEATING DEGREE-DAYS		COOLING DEGREE-DAYS Base 18°C		CUMULATIVE COOLING DEGREE-DAYS		EXTREME COOLING DEGREE-DAYS Base 24°C	
	2007	Normal	2007	Normal	2007	Normal	2007	Normal	2007	Normal
January	903.0	1076.9	903.0	1076.9	0.0	0.0	0.0	0.0	0.0	0.0
February	972.2	886.2	1875.2	1963.1	0.0	0.0	0.0	0.0	0.0	0.0
March	673.9	732.4	2549.1	2695.5	0.0	0.0	0.0	0.0	0.0	0.0
April	388.7	420.7	2937.8	3116.2	0.0	0.3	0.0	0.3	0.0	0.0
May	189.4	204.4	3127.2	3320.6	0.8	7.4	0.8	7.7	0.0	0.2
June	77.0	82.8	3204.2	3403.4	12.1	22.3	12.9	30.0	0.0	1.1
July	9.1	35.3	3213.3	3438.7	125.6	40.7	138.5	70.7	13.3	1.5
August	70.6	57.7	3283.9	3496.4	29.8	42.5	168.3	113.2	0.9	2.4
September	199.6	198.9	3483.5	3695.3	5.1	5.8	173.4	119.0	0.0	0.1
October	366.4	410.2	3849.9	4105.5	0.0	0.1	173.4	119.1	0.0	0.0
November	678.4	715.8	4528.3	4821.3	0.0	0.0	173.4	119.1	0.0	0.0
December	1001.2	987.7	5529.5	5809.0	0.0	0.0	173.4	119.1	0.0	0.0
Total	5529.5	5809.0			173.4	119.1			14.2	6.8


HEATING DEGREE-DAYS
CUMULATIVE HEATING DEGREE-DAYS
Jan Feb Mar Apr May June July Aug Sep Oct Nov Dec
2007 Heating Degree-days (Base 18°C)
Normal Heating Degree-days (Base 18°C)
2007 Cumulative Heating Degree-days (Base 18°C)
Normal Cumulative Heating Degree-days (Base 18°C)

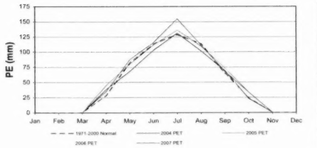

COOLING DEGREE-DAYS
CUMULATIVE COOLING DEGREE-DAYS
Jan Feb Mar Apr May June July Aug Sep Oct Nov Dec
2007 Cooling Degree-days (Base 18°C)
Normal Cooling Degree-days (Base 18°C)
2007 Cumulative Cooling Degree-days (Base 18°C)
Normal Cumulative Cooling Degree-days (Base 18°C)

Monthly Growing Degree-days, 2007

MONTH	GROWING DEGREE-DAYS Base 5°C		CUMULATIVE GROWING DD Base 5°C		FROST-FREE GROWING DD Base 5°C	
	2007	Normal	2007	Normal	2007	Normal
January	0.0	0.0	0.0	0.0	0.0	0.0
February	0.0	0.0	0.0	0.0	0.0	0.0
March	1.4	2.4	1.4	2.4	0.0	0.0
April	98.1	61.3	99.5	63.7	0.0	0.0
May	214.4	211.6	313.9	275.3	137.8	116.2
June	325.1	331.5	639.0	606.8	325.1	330.8
July	519.5	408.4	1158.5	1015.2	519.5	408.4
August	362.2	387.8	1520.7	1403.0	362.2	376.1
September	195.5	203.5	1716.2	1606.5	109.8	110.9
October	61.7	63.7	1777.9	1670.2	0.0	2.9
November	0.2	2.6	1778.1	1672.8	0.0	0.0
December	0.0	0.1	1778.1	1672.9	0.0	0.0
Total	1778.1	1672.9			1454.4	1345.3


GROWING DEGREE-DAYS
CUMULATIVE GROWING DEGREE-DAYS
Jan Feb Mar Apr May June July Aug Sep Oct Nov Dec
2007 Growing Degree-days (Base 5°C)
Normal Growing Degree-days (Base 5°C)
2007 Frost-free Growing Degree-days (Base 5°C)
Normal Cumulative Growing Degree-days (Base 5°C)
2007 Cumulative Frost-free Growing Degree-days (Base 5°C)
2007 Cumulative Growing Degree-days (Base 5°C)

Potential Evapotranspiration (PE) using the Thornthwaite Method



MONTH	AVERAGE TEMP °C 2007	PET (mm) 2007	PET 1971-2000 Normal (mm)
Jan	-11.1	0.0	0.0
Feb	-16.7	0.0	0.0
Mar	-3.7	0.0	0.0
Apr	5.0	34.6	28.6
May	11.9	87.1	81.5
June	15.8	115.1	113.2
July	21.8	154.5	128.9
Aug	18.7	110.9	113.3
Sept	11.5	67.3	64.9
Oct	6.2	33.3	24.3
Nov	-4.6	0.0	0.0
Dec	-14.3	0.0	0.0
Total		602.8	554.7

Sunrise and Sunset at Saskatoon, 2007 and 2008

(local time in hours and minutes)

2007	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
Date	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
1	9:15	17:50	8:43	17:53	7:51	18:47	6:42	19:43	5:39	20:33	4:52	21:15	4:52	21:53	5:27	21:11	6:18	19:54	7:08	18:44	8:03	17:36	8:54	16:58
2	9:15	17:56	8:41	17:56	7:51	18:48	6:39	19:42	5:38	20:33	4:51	21:16	4:51	21:53	5:29	20:56	6:19	19:52	7:09	18:42	8:03	17:36	8:54	16:58
3	9:15	17:57	8:44	17:58	7:48	18:50	6:37	19:44	5:38	20:33	4:50	21:20	4:52	21:50	5:31	20:54	6:21	19:50	7:10	18:40	8:03	17:36	8:53	16:57
4	9:15	17:58	8:42	17:59	7:46	18:53	6:35	19:45	5:37	20:34	4:50	21:21	4:52	21:48	5:32	20:52	6:23	19:48	7:12	18:38	8:04	17:35	8:53	16:56
5	9:14	17:59	8:40	18:01	7:44	18:55	6:32	19:47	5:36	20:36	4:49	21:22	4:53	21:46	5:34	20:50	6:24	19:45	7:14	18:35	8:05	17:34	8:52	16:56
6	9:14	17:59	8:39	18:03	7:42	18:58	6:30	19:49	5:35	20:37	4:48	21:24	4:54	21:44	5:36	20:48	6:26	19:43	7:15	18:33	8:06	17:33	8:52	16:55
7	9:14	17:12	8:37	18:05	7:39	18:57	6:28	19:51	5:35	20:42	4:48	21:25	4:55	21:27	5:37	20:47	6:27	19:41	7:17	18:31	8:07	17:31	8:51	16:54
8	9:13	17:14	8:35	18:07	7:37	19:00	6:25	19:53	5:34	20:43	4:47	21:26	4:56	21:25	5:39	20:45	6:29	19:39	7:18	18:29	8:08	17:29	8:50	16:53
9	9:13	17:15	8:33	18:09	7:35	19:02	6:23	19:54	5:32	20:45	4:46	21:27	4:57	21:23	5:40	20:43	6:31	19:36	7:21	18:26	8:10	17:26	8:50	16:53
10	9:12	17:16	8:32	18:11	7:33	19:04	6:21	19:56	5:31	20:46	4:45	21:28	4:58	21:21	5:42	20:41	6:32	19:34	7:22	18:24	8:12	17:23	8:49	16:52
11	9:11	17:18	8:30	18:13	7:30	19:06	6:19	19:58	5:29	20:48	4:45	21:27	4:59	21:20	5:43	20:39	6:34	19:31	7:24	18:22	8:20	17:21	9:05	16:54
12	9:10	17:19	8:28	18:14	7:28	19:08	6:17	20:00	5:28	20:49	4:44	21:26	5:00	20:17	5:45	20:37	6:36	19:29	7:25	18:20	8:21	17:20	9:06	16:54
13	9:10	17:21	8:26	18:16	7:26	19:10	6:15	20:02	5:26	20:51	4:43	21:25	5:01	20:15	5:46	20:35	6:37	19:27	7:26	18:17	8:23	17:18	9:07	16:54
14	9:09	17:22	8:24	18:18	7:24	19:12	6:13	20:04	5:25	20:52	4:42	21:24	5:02	20:13	5:48	20:33	6:39	19:25	7:28	18:15	8:24	17:16	9:08	16:54
15	9:08	17:24	8:22	18:20	7:22	19:14	6:11	20:06	5:23	20:54	4:41	21:23	5:03	20:11	5:49	20:31	6:40	19:23	7:29	18:13	8:26	17:15	9:09	16:54
16	9:07	17:25	8:20	18:22	7:20	19:16	6:09	20:08	5:22	20:55	4:40	21:22	5:04	20:09	5:50	20:29	6:42	19:21	7:31	18:11	8:27	17:13	9:10	16:54
17	9:06	17:27	8:18	18:24	7:18	19:18	6:07	20:10	5:20	20:57	4:39	21:21	5:05	20:07	5:52	20:27	6:43	19:19	7:32	18:09	8:29	17:12	9:11	16:54
18	9:05	17:28	8:16	18:26	7:16	19:20	6:05	20:12	5:19	20:58	4:38	21:20	5:07	20:05	5:53	20:25	6:45	19:17	7:34	18:06	8:32	17:10	9:12	16:55
19	9:04	17:31	8:14	18:28	7:12	19:22	6:03	20:14	5:17	21:00	4:37	21:19	5:08	20:03	5:55	20:23	6:47	19:13	7:36	18:04	8:34	17:09	9:13	16:55
20	9:03	17:32	8:12	18:29	7:09	19:24	6:01	20:16	5:16	21:02	4:36	21:18	5:10	20:01	5:56	20:21	6:49	19:10	7:40	18:02	8:35	17:08	9:14	16:55
21	9:02	17:34	8:10	18:31	7:07	19:25	5:57	20:18	5:14	21:03	4:35	21:17	5:11	21:14	5:58	20:19	6:50	19:08	7:42	18:00	8:37	17:07	9:15	16:56
22	9:01	17:36	8:08	18:33	7:05	19:27	5:55	20:19	5:13	21:05	4:34	21:16	5:13	21:12	6:00	20:16	6:52	19:06	7:43	17:58	8:39	17:06	9:15	16:56
23	9:00	17:37	8:06	18:35	7:02	19:28	5:53	20:18	5:11	21:06	4:34	21:14	5:14	21:11	6:03	20:14	6:54	19:03	7:45	17:56	8:40	17:05	9:14	16:57
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2008	JANUARY		FEBRUARY		MARCH		APRIL		MAY		JUNE		JULY		AUGUST		SEPTEMBER		OCTOBER		NOVEMBER		DECEMBER	
Date	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set	Rise	Set
1	9:15	17:50	8:43	17:53	7:51	18:47	6:42	19:43	5:39	20:33	4:52	21:15	4:52	21:53	5:27	21:11	6:18	19:54	7:08	18:44	8:03	17:36	8:54	16:58
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3	9:15	17:57	8:44	17:58	7:48	18:50	6:37	19:44	5:38	20:33	4:50	21:20	4:52	21:50	5:31	20:54	6:21	19:50	7:10	18:40	8:03	17:36	8:53	16:57
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30	8:50	17:50			6:46	19:37	5:39	20:30	4:54	21:15	4:29	21:06	5:24	21:00	6:14	19:58	7:05	18:47	7:58	17:42	8:51	16:59	9:15	17:02
31	8:49	17:52			6:44	19:39			4:53	21:15	4:28	21:05	5:26	20:58	6:15	19:57			8:00	17:40			9:15	17:04

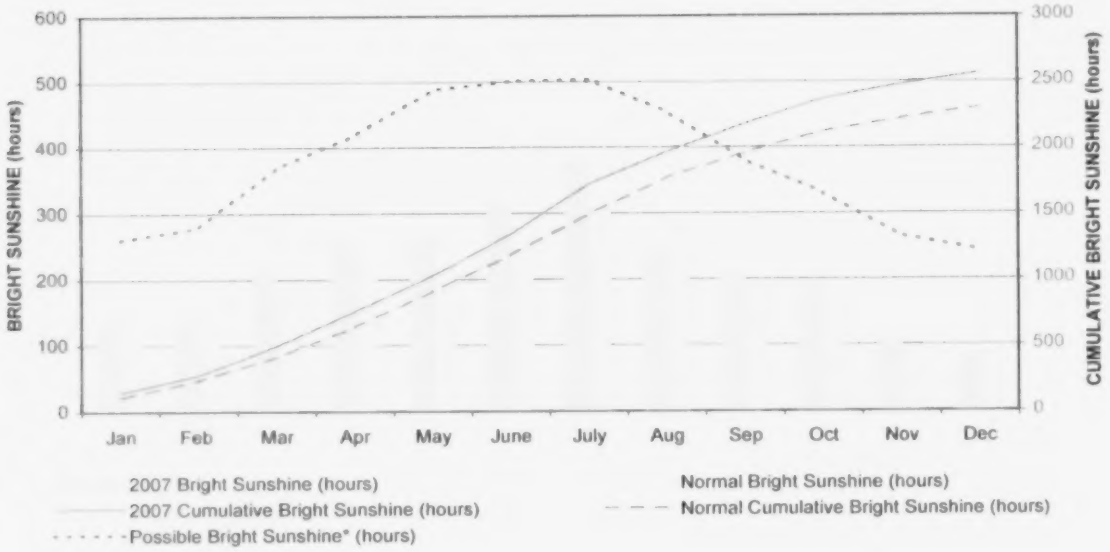
Source: National Research Council, Canada, Herzberg Institute of Astrophysics Sunrise/set corresponds to the upper limb of the sun appearing at the horizon

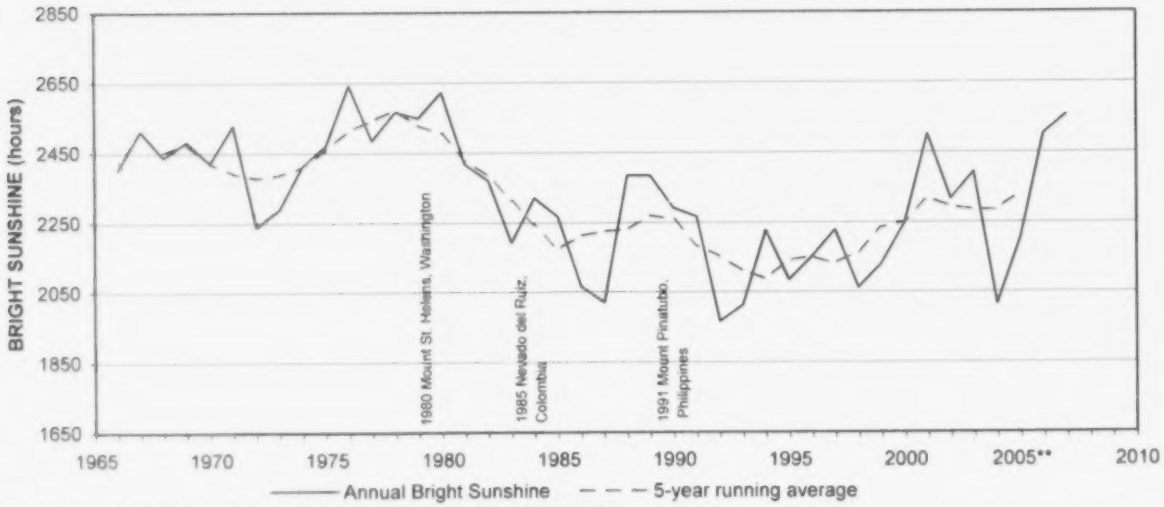
Spring apple blossoms and water vessel - House Finch photo credit: C.W. Braiden

Bright Sunshine for 2007 and Annual Trend

MONTH	BRIGHT SUNSHINE (hours)					CUMULATIVE BRIGHT SUNSHINE (hours)		NUMBER OF BRIGHT SUNSHINE DAYS	
	2007	Normal	% of Normal	Possible*	% of Possible	2007	Normal	2007	NORMAL
January	140.7	103.3	136.2	259.0	54.3	140.7	103.3	29	23.8
February	132.7	132.3	100.3	278.5	47.6	273.4	235.6	24	24.2
March	217.5	175.2	124.1	368.8	59.0	490.9	410.8	28	27.1
April	262.1	225.2	116.4	418.0	62.7	753.0	636.0	29	27.3
May	267.0	267.1	100.0	487.2	54.8	1020.0	903.1	29	29.5
June	314.7	277.2	113.5	500.0	62.9	1334.7	1180.3	29	28.5
July	383.7	305.7	125.5	502.1	76.4	1718.4	1486.0	31	30.3
August	242.4	280.8	86.3	453.0	53.5	1960.6	1766.8	30	30.1
September	209.0	186.0	112.4	379.6	55.1	2169.8	1952.8	27	27.0
October	190.8	157.9	120.8	329.7	57.9	2360.6	2110.7	28	27.0
November	107.6	98.0	109.8	264.4	40.7	2468.2	2208.7	21	22.2
December	85.0	85.4	99.5	242.4	35.1	2553.2	2294.1	23	22.8
Total	2553.2	2294.1	111.3	4482.8	57.0			328.0	319.8

*Possible bright sunshine hours calculated from Nat. Res. Council of Canada, Hertzberg Institute of Astrophysics sunrise/set table for 2006





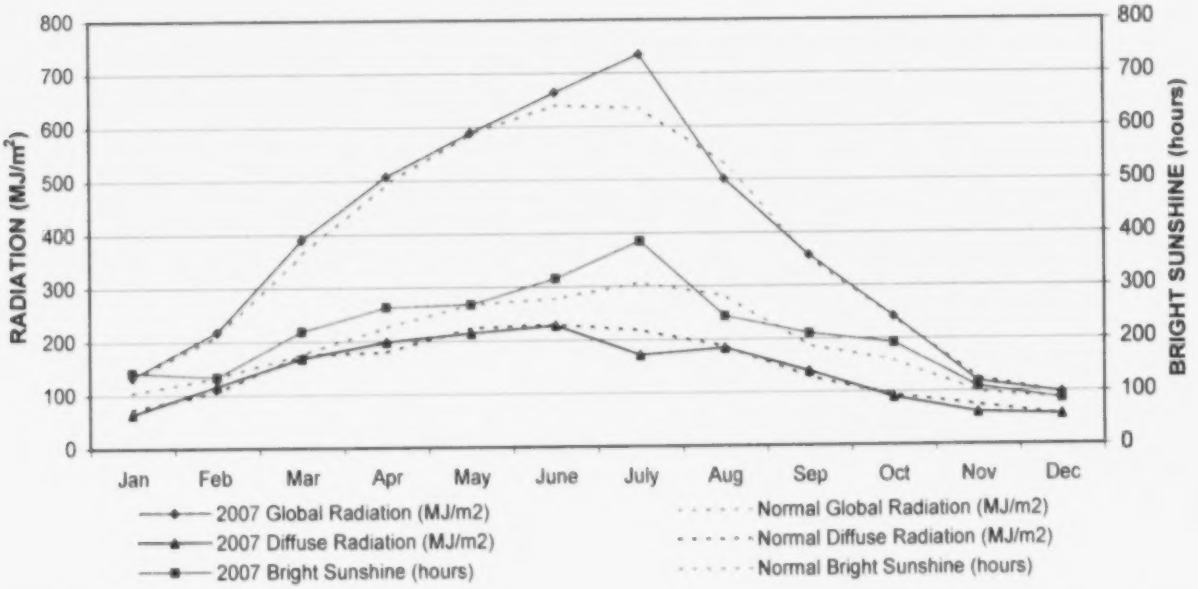
**Bright sunshine recorder in for scheduled re-calibration check. Data for Dec 2004 and Jan 2005 are estimates based on Global radiation readings

Global and Diffuse Solar Radiation, 2007
(MJ/m²)

DATE	JAN		FEB		MAR		APR		MAY		JUN		JULY		AUG		SEPT		OCT		NOV		DEC	
	G	D	G	D	G	D	G	D	G	D	G	D	G	D	G	D	G	D	G	D	G	D	G	D
1	4.6	1.2	7.1	3.4	10.2	7.4	4.3	4.1	14.8	8.9	24.4	7.3	27.9	5.5	18.4	8.8	11.7	7.8	9.9	6.2	4.4	3.0	2.9	2.9
2	2.9	1.4	7.5	1.6	12.4	3.9	11.2	9.1	16.2	7.9	25.9	5.9	24.4	8.8	26.2	2.6	12.9	7.3	12.8	3.1	6.8	1.4	2.6	1.7
3	3.6	1.2	9.1	1.7	10.7	7.4	15.9	8.6	21.0	8.2	18.3	8.6	28.9	2.9	24.9	5.2	18.1	3.8	10.3	3.2	6.7	1.5	2.1	2.1
4	1.9	1.9	4.3	3.9	9.7	8.4	13.2	9.4	8.0	5.6	28.9	5.4	29.0	3.9	23.2	5.0	11.9	8.2	12.6	2.6	6.0	2.3	2.3	2.3
5	3.6	1.2	5.5	5.0	7.0	6.7	18.7	5.9	25.9	4.5	24.6	9.2	28.7	3.2	23.6	4.9	19.5	2.3	5.2	4.9	6.8	1.4	2.3	2.3
6	2.0	1.9	6.4	5.0	10.8	7.9	21.5	2.3	23.2	5.1	9.5	7.9	28.2	3.8	11.9	7.8	5.7	4.7	2.7	2.7	4.2	3.1	3.0	2.2
7	3.4	2.1	8.1	3.0	13.2	3.8	21.7	2.3	25.1	4.7	28.3	6.7	27.1	5.6	24.3	3.6	10.3	7.1	12.6	1.8	7.1	1.4	4.6	1.5
8	2.5	2.2	7.1	3.4	14.1	5.0	19.2	6.8	24.3	4.5	24.5	9.3	23.9	6.3	21.5	5.4	11.7	5.8	5.8	4.7	3.4	2.6	5.3	1.2
9	3.9	1.9	9.5	3.1	13.3	2.7	19.4	7.3	23.7	7.6	20.9	11.2	8.7	6.4	8.1	6.1	16.0	4.7	11.6	2.1	2.9	2.5	5.0	2.0
10	1.1	1.1	9.0	4.3	13.7	2.5	14.7	10.3	25.2	4.9	11.3	9.5	26.7	6.2	6.8	5.8	13.8	6.2	10.5	2.2	5.1	2.0	2.1	2.1
11	5.8	1.3	7.8	3.9	13.3	6.0	9.4	8.1	25.7	5.5	17.8	7.4	19.0	8.0	18.9	6.4	15.4	4.1	1.5	1.6	6.4	1.3	5.2	1.2
12	5.7	1.8	10.1	2.7	13.0	3.9	17.6	5.5	15.7	6.2	26.3	7.2	27.5	4.0	19.9	6.7	5.2	4.9	9.9	2.4	3.9	3.0	1.3	1.3
13	3.4	2.4	10.1	2.9	14.3	3.2	21.7	2.7	14.8	10.1	29.0	5.4	27.4	3.3	20.7	6.8	10.4	6.1	5.2	3.8	1.3	1.2	2.6	2.6
14	5.2	1.4	8.5	2.8	5.9	5.7	20.0	4.7	17.6	9.2	26.9	6.3	25.6	4.8	15.6	8.5	17.9	2.2	7.6	2.9	5.7	1.2	2.4	2.0
15	4.7	1.4	9.0	1.8	12.8	8.3	16.5	8.2	27.3	4.4	23.6	8.7	20.9	6.3	19.8	6.4	16.3	3.2	10.7	1.7	2.4	1.6	1.8	1.8
16	4.7	2.3	8.3	4.1	15.3	6.3	21.3	4.7	27.0	6.9	25.5	8.5	23.3	8.0	23.6	2.6	16.8	2.2	10.3	1.9	1.4	1.4	2.3	1.7
17	4.2	1.3	4.8	4.8	9.1	8.2	19.5	5.4	24.4	7.3	2.3	2.1	24.9	8.0	12.4	7.7	3.0	2.8	2.3	2.3	2.2	2.2	2.9	2.2
18	5.3	2.4	7.1	4.9	12.7	4.0	17.5	8.3	18.0	12.2	18.4	10.3	26.8	5.6	6.5	4.3	15.4	3.4	3.7	3.3	1.9	2.0	5.6	1.2
19	4.5	2.2	5.5	5.1	10.6	8.2	20.9	7.0	18.6	7.4	25.8	8.0	25.8	6.3	9.1	6.9	9.0	6.3	9.7	1.8	1.9	1.9	3.9	1.2
20	5.3	2.9	5.5	5.4	13.5	8.4	9.7	7.3	16.1	9.7	28.3	5.6	14.6	4.4	5.8	5.0	7.5	5.9	6.0	4.7	2.6	2.6	2.4	2.2
21	5.7	1.9	6.1	6.0	16.3	4.1	7.9	7.2	3.5	3.2	25.7	8.3	22.7	4.7	16.4	5.9	15.3	3.2	9.4	2.0	3.3	3.1	3.8	1.2
22	3.9	3.7	4.5	4.4	16.1	4.4	12.3	8.9	9.2	8.0	28.9	5.3	25.8	4.5	4.7	4.0	14.1	3.2	5.7	4.9	3.9	2.9	4.6	1.2
23	4.1	2.0	3.2	3.1	16.8	2.4	13.2	9.7	8.2	7.3	23.3	7.3	26.0	3.2	10.3	7.4	3.0	2.5	6.1	3.7	1.8	1.8	4.3	1.2
24	3.4	3.1	6.9	6.6	10.9	8.1	19.9	6.7	20.8	11.0	25.3	8.7	14.7	8.2	20.8	4.1	13.1	3.7	6.7	3.7	2.8	2.6	3.2	1.6
25	5.5	1.3	7.9	7.3	15.2	5.9	23.2	4.1	27.5	5.5	5.3	4.5	20.8	7.6	17.4	7.3	10.9	6.3	8.9	1.6	1.9	1.8	1.5	1.5
26	3.9	2.8	14.2	3.1	16.6	2.9	20.5	6.1	28.0	4.2	13.3	9.5	26.8	2.6	10.1	8.1	8.9	5.7	4.5	3.2	4.7	1.3	2.9	2.4
27	7.3	1.9	15.2	4.7	2.8	2.7	21.0	5.8	24.7	7.1	30.2	3.2	21.7	7.3	12.6	6.6	13.5	3.4	9.0	2.0	1.6	1.6	1.7	1.7
28	5.0	2.7	8.2	7.0	7.4	6.0	22.6	5.8	12.5	8.7	24.4	9.2	24.9	4.7	16.4	4.7	11.7	3.9	7.9	1.6	4.5	1.5	1.8	1.6
29	8.0	1.4			19.7	2.2	17.8	7.1	2.6	2.5	20.3	12.3	25.7	4.3	11.1	9.1	3.2	3.2	7.3	1.6	5.7	1.3	2.0	2.0
30	3.9	3.8			19.2	2.1	14.2	8.1	10.5	9.2	25.3	7.9	23.8	4.7	20.5	2.4	13.4	3.7	6.9	2.2	4.2	1.6	3.6	2.0
31	3.8	3.5			11.8	8.3			27.6	5.5			10.8	7.3	17.8	4.6			6.6	2.5			4.2	1.2
TOTAL	132.8	63.6	216.5	115.0	388.6	167.0	506.5	197.5	587.7	213.0	662.5	226.7	733.0	170.4	499.3	182.7	355.6	137.8	239.9	88.9	117.5	59.1	96.2	55.3

COMMENTS G= Global Radiation D= Diffuse Radiation Units = MJ/m2

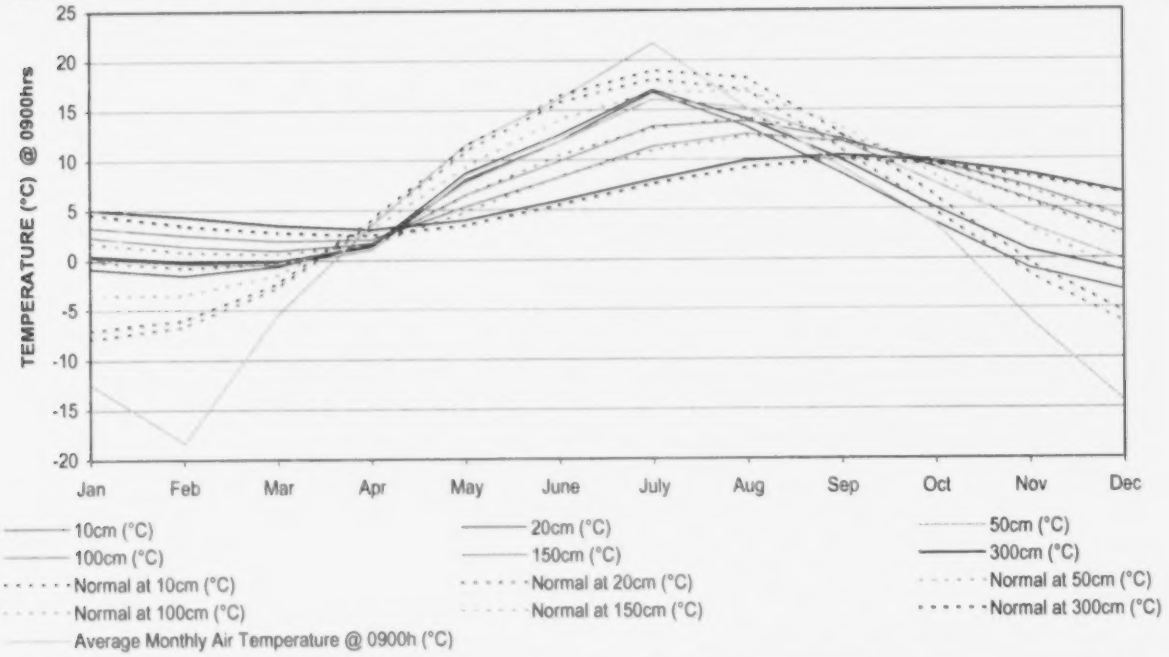
Oct 11, Nov 18 = within instrument tolerance

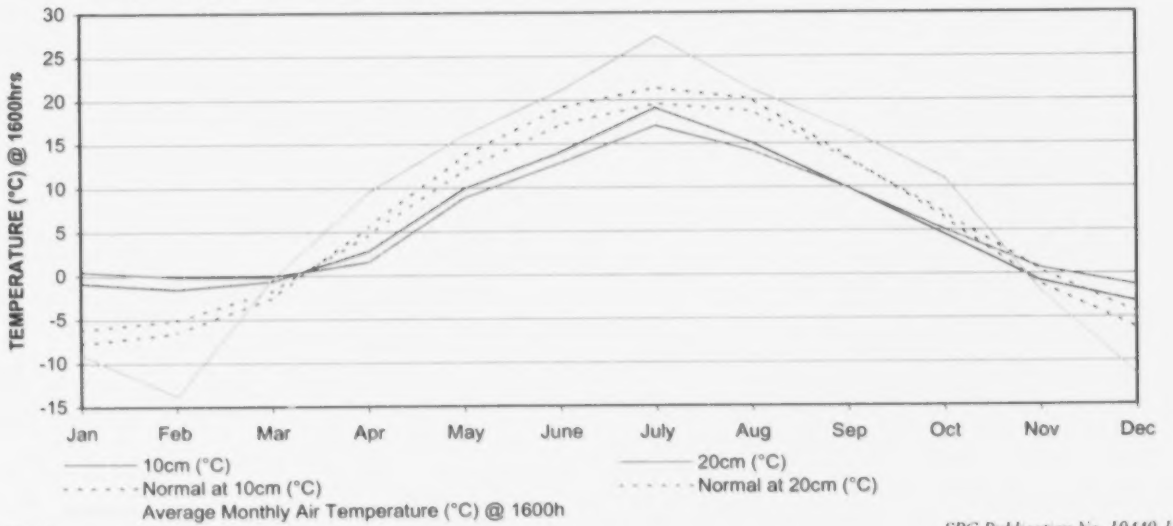


Monthly Average Soil Temperatures, 2007

(10 to 300cm depths)

MONTH	Mean Air Temp @ 0900h (°C)	SOIL TEMPERATURES (C°) @ 0900hrs												Mean Air Temp @ 1800h (°C)	SOIL TEMPERATURES @ 1600hrs			
		10cm		20cm		50cm		100cm		150cm		300cm			10cm		20cm	
		2007	NORM	2007	NORM	2007	NORM	2007	NORM	2007	NORM	2007	NORM		2007	NORM	2007	NORM
January	-12.4	-0.9	-8.0	0.4	-7.1	0.2	-3.5	2.3	-0.1	3.3	1.7	5.0	4.6	-9.0	-0.9	-7.8	0.4	-6.2
February	-18.3	-1.6	-6.7	-0.2	-6.1	-0.4	-3.5	1.4	-0.8	2.5	0.8	4.3	3.4	-13.8	-1.6	-6.6	-0.2	-5.2
March	-5.4	-0.7	-2.8	-0.2	-2.4	-0.5	-1.5	0.9	-0.4	1.9	0.6	3.4	2.7	-0.4	-0.7	-2.6	-0.2	-1.8
April	3.5	1.5	3.6	1.3	4.0	1.0	3.0	1.6	1.6	2.0	1.5	3.0	2.4	9.5	2.7	5.5	1.5	4.6
May	11.5	7.8	10.8	8.6	11.3	8.0	9.3	6.5	6.4	5.3	4.8	3.9	3.4	16.0	9.8	13.6	8.8	12.0
June	16.1	11.8	15.7	12.4	16.3	11.8	14.0	9.8	10.4	8.2	8.3	5.8	5.4	21.0	13.9	19.0	12.7	17.1
July	21.7	16.7	18.0	16.9	18.9	16.0	16.7	13.3	13.1	11.3	10.9	7.9	7.5	27.3	19.0	21.3	17.0	19.5
August	15.1	13.2	16.9	14.0	18.1	15.1	16.8	13.8	14.1	12.5	12.3	9.8	9.1	21.2	15.0	20.0	14.1	18.6
September	9.2	8.5	11.0	9.9	12.5	11.8	13.2	12.0	12.4	11.7	11.7	10.3	9.9	16.5	9.8	13.4	9.8	13.1
October	3.4	3.5	4.7	5.0	6.2	7.5	8.3	9.1	9.2	9.6	9.6	9.7	9.4	11.0	4.5	6.4	5.0	6.9
November	-6.2	-1.1	-1.7	0.7	-0.5	3.2	3.0	5.8	5.6	7.1	6.8	8.4	8.1	-2.0	-0.9	-1.2	0.6	0.3
December	-14.4	-3.3	-6.6	-1.4	-5.6	-0.3	-1.7	2.5	2.0	4.1	3.8	6.5	6.4	-11.6	-3.3	-6.3	-1.4	-4.6

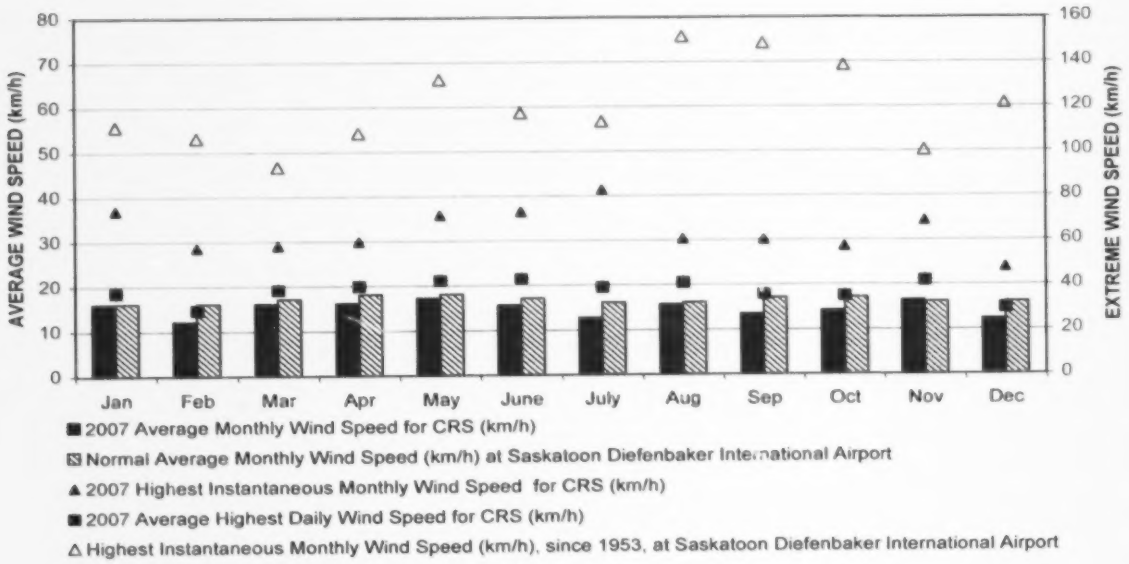




Monthly Wind Speeds, 2007

MONTH	AVERAGE WIND SPEED (km/h)			HIGHEST INSTANTANEOUS WIND SPEED (km/h)	
	2007 Average	Normal*	2007 Maximum Average	2007 for CRS (Speed/direction/date)	Since 1953 (Saskatoon Diefenbaker Int'l Airport) (Speed/direction/date)
January	15.9	16	36.9	73.6^{NE}10	111^{W}1986/11
February	12.0	16	29.2	56.9^{N}01	106^{N}1988/22
March	16.0	17	38.1	54.8^{E}27	93^{W}1959/18
April	16.1	18	39.5	59.4^{ESE}19	108^{W}1959/06
May	17.1	18	42.1	71.2^{NW}12	132^{SW}1965/17
June	15.5	17	42.6	72.7^{N}18	117^{S}1986/01
July	12.6	16	38.8	82.3^{W}21	113^{E}1955/05
August	15.6	16	40.8	60.4^{W}20	151^{W}1967/14
September	13.4	17	35.6	60.0^{NW}26	148^{W}1967/22
October	14.1	17	34.7	56.9^{WNW}25	138^{NW}1967/16
November	16.4	16	41.6	68.4^{WNW}13	100^{N}1976/17
December	12.2	16	29.4	47.3^{WNW}21	121^{W}1955/12

*1961-90 Normals used are from the Environment Canada, Saskatoon Diefenbaker International Airport station, 1993



Windchill Calculation Chart[1]

V \ T	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45	-50
5	4	-2	-7	-13	-19	-24	-30	-36	-41	-47	-53	-58
10	3	-3	-9	-15	-21	-27	-33	-39	-45	-51	-57	-63
15	2	-4	-11	-17	-23	-29	-35	-41	-48	-54	-60	-66
20	1	-5	-12	-18	-24	-31	-37	-43	-49	-56	-62	-68
25	1	-6	-12	-19	-25	-32	-38	-45	-51	-57	-64	-70
30	0	-7	-13	-20	-26	-33	-39	-46	-52	-59	-65	-72
35	0	-7	-14	-20	-27	-33	-40	-47	-53	-60	-66	-73
40	-1	-7	-14	-21	-27	-34	-41	-48	-54	-61	-68	-74
45	-1	-8	-15	-21	-28	-35	-42	-48	-55	-62	-69	-75
50	-1	-8	-15	-22	-29	-35	-42	-49	-56	-63	-70	-76
55	-2	-9	-15	-22	-29	-36	-43	-50	-57	-63	-70	-77
60	-2	-9	-16	-23	-30	-37	-43	-50	-57	-64	-71	-78
65	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79
70	-2	-9	-16	-23	-30	-37	-44	-51	-59	-66	-73	-80
75	-3	-10	-17	-24	-31	-38	-45	-52	-59	-66	-73	-80
80	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81

Approximate Thresholds:

-25	Risk of frostbite in prolonged exposure
-35	Frostbite possible in 10 minutes with warm skin suddenly exposed Shorter time if skin is cool at the start.
-60	Frostbite possible in less than 2 minutes with warm skin suddenly exposed. Shorter time if skin is cool at the start.

where T = Air temperature (°C) and
V = Observed wind speed (km/h) at 10m elevation .

1. Environment Canada, 2001a, 2001b

Saskatchewan Research Council

Annual Weather Summary

latitude 52°09'N Longitude 106°36W asl 497 m Saskatoon

CRS estab 1963

		2007 VALUE	2006 VALUE	NORMAL (1971-2000) OR EXTREME (1892-2004)
TEMPERATURE	Average annual maximum (°C)	8.6	9.6	8.3
	Extreme annual maximum (°C/date)	37.1 July 23	34.7 August 29	41.0 June 1988
	Average annual minimum (°C)	-2.2	-1.3	-3.4
	Extreme annual minimum (°C/date)	-31.1 February 12&14	-31.8 February 16	-50.0 Feb. 1893
	Annual **average** (°C)	3.2	4.2	2.5
	No.of Frost-free days (Temperature ≥ 0°C)	189	179	197.1
DEGREE-DAYS	Annual growing (5°C base)	1778.1	1927.4	1672.9
	Annual frost-free growing (5°C base)	1454.4	1699.2	1691.0
	Annual heating (18°C base)	5529.5	5213.1	5808.8
	Annual cooling (18°C base)	173.4	199.3	119.1
PRECIPITATION	Annual total (mm)	413.9	517.5	348.2
	Greatest Daily (mm/date)	68.0 June 17	52.4 September 15	99.4 June 24, 1983
	Greatest Monthly (mm/date)	109.4 June	128.4 September	160.1/June 1991
	Measurable precipitation days (≥ 0.2mm)	128	139	115.7
WIND	Average Annual wind speed (km/h)	14.7	14.9	16.6*
	Peak gust (speed/direction/date)	82.3^{W}July21	87.7^{WNW}August 04	151.0 ^{W}Aug 14, 1967*
RADIATION	Total annual bright sunshine (hours)	2553.2	Annual Bright	2294.1
	% possible bright sunshine	57.0	sunshine is not	51.2
	% normal bright sunshine	111.3	available (January	
	Bright Sunshine days	328	missing)	319.9
	% of normal Bright Sunshine days	102.6		
	Total annual global radiation(MJ/m^2)	4536.1	4538.4	4391.9**
	Total annual diffuse radiation (MJ/m^2)	1677.0	1645.6	1729.6**

For Your Information

Normal and Extreme Values

The 1971-2000 normals for CRS have been calculated from original data entered on computerized spreadsheets and checked for correctness. Where suitable, missing data has been replaced with data from the University of Saskatchewan, Kernen Farm station (2.5 km E of CRS) and the Saskatoon Diefenbaker International Airport (DIA) station (10 km WNW of CRS). Wind normals marked with '*' are from the Saskatoon DIA station. Global and Diffuse radiation normals are from 1961-1990 period and are marked with'**'. Extreme values are from the Saskatoon area weather stations extending back to 1882. The earlier records from 1882 to 1901 have several large gaps.

2006 Missing Values

On September 8th, the wind tower was lowered for routine maintenance for 3½ hours.

There is no Bright Sunshine data for January due to the instrument being sent in for routine calibration.

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Monthly Weather Summary

latitude 52°09'N Longitude 106°36'W asl 497 m Saskatoon

CRS estab. 1963

	January 2007	2007 VALUE	2006 VALUE	NORMAL OR EXTREME FOR CRS 1971-2000	EXTREME FOR SASKATOON STATIONS
TEMPERATURE	Average monthly **maximum** (°C)	-6.3	-3.2	-11.6	
	Extreme monthly maximum (°C/date)	5.2/02	5.1/25	7.0/1986/11&1993/30	11.0/1980/23$_{SWT}$
	Average monthly **minimum** (°C)	-15.9	-11.4	-21.8	
	Extreme monthly minimum (°C/date)	-31.2/12	-27.2/21	-43.9/1966/22&1969/29	-48.9/1893/31$_{SM}$
	Monthly **average** (°C)	-11.1	-7.3	-16.7	
	No. of Frost-free days (Temp. > 0°C)	1	0	0	
DEGREE-DAYS	Monthly growing (5°C base)	0.0	0.0	0.0	
	Yearly total-to-date growing	0.0	0.0	0.0	
	Monthly heating (18°C base)	903.0	784.7	1076.9	
	Yearly total-to-date heating	903.0	784.7	1076.9	
	Monthly cooling (18°C base)	0.0	0.0	0.0	
	Yearly total-to-date cooling	0.0	0.0	0.0	
PRECIPITATION	Monthly total (mm)	45.7	11.3	18.2	66.1/1911$_{SE}$
	Yearly total-to-date (mm)	45.7	11.3	18.2	
	Greatest daily (mm/date)	35.2/10	5.1/15	15.4/1989/30	30.5/1893/23$_{SM}$
	Measurable precipitation days (≥ 0.2mm)	10	11	11.3	
WIND	Average monthly speed (km/h)	15.9	13.5	16.0$_{SA}$	
	Peak gust (speed/direction/date)	73.6^{NE}10	61.0^{NW}23		111^{W}1986/11$_{SA}$
RADIATION	Monthly bright sunshine (hours)	140.7	bright	103.3	
	% possible bright sunshine	54.3	sunshine	39.8	
	% normal bright sunshine	136.2	not		
	Bright Sunshine days	29	available	23.8	
	Monthly global radiation(MJ/m²)	132.8	92.5	129.9	
	Monthly diffuse radiation (MJ/m²)	63.6	*72.4	71.4	
SOIL	Average temperature (°C) @ 9:00am — grass level	3.3	2.2		
	10 cm/20 cm	-0.9/0.4	-1.4/-0.1	-8.0/-7.1	
	50 cm/100cm	0.2/2.3	-0.4/1.8	-3.5/-0.1	
	150 cm/300cm	3.3/5.0	2.9/4.9	1.7/4.6	

Saskatoon Stations
SM=interrupted readings (NWMP) about 1892-1900
SE= Eby (pioneer) 1901-41
SA= S'toon Airport 1942-
SWT= S'toon Water Treatment Plant 1974-

Normals
Global and diffuse radiation = 1961-1990
Soil Temp. = 1971-2000 calculated by Env. Canada
Wind Normal and Extreme are from Saskatoon Airport

*Diffuse rng slipped for 1½ days.

For Your Information

Saskatoon and area experienced a now uncommon event on January 10th; an old fashioned, can't-see-past-your-nose, prairie blizzard. News media stories were full of local heroes and idiots who braved the 73.6 km/h winds whipping 36 cm of snow into the worse blizzard conditions in 50 years.[1] During the 9th and 10th, almost twice the normal monthly snowfall fell. The monthly precipitation was 2½ times normal while the average temperatures were well above normal. Daytime highs exceeded 0°C on five occasions. On the 3rd, temperatures remained above freezing but by the 11th, the daily minimum temperature plunged below -29°C where it remained until the 14th. There was 37.4 hours more bright sunshine than normal.

A monthly total of 45.7 cm of snow for January is a lot for Saskatoon but in 1916 in Vancouver 67.7 cm fell during the month. One pedestrian, not hearing a car horn, was hit and driven over but thanks to the protective cushion of snow, he was not injured.[2]

[1] Various reports, 2007. [2] Phillips2006

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Monthly Weather Summary

latitude 52°09'N Longitude 106°36'W asl 497 m Saskatoon

CRS estab. 1963

	February 2007	2007 VALUE	2006 VALUE	NORMAL OR EXTREME FOR CRS 1971-2000	EXTREME FOR SASKATOON STATIONS
TEMPERATURE	Average monthly **maximum** (°C)	-12.3	-6.4	-7.7	
	Extreme monthly maximum (°C/date)	0.2/15	5.4/12	8.3/2005/02	12.8/1931/19$_{SE}$
	Average monthly **minimum** (°C)	-21.1	-16.6	-17.6	
	Extreme monthly minimum (°C/date)	-31.1/12&14	-31.8/16	-41.1/1972/06	-50.0/1893/01$_{SM}$
	Monthly **average** (°C)	-16.7	-11.5	-12.6	
	No.of Frost-free days (Temp. > 0°C)	0	0	0.2	
DEGREE-DAYS	Monthly growing (5°C base)	0.0	0.0	0.0	
	Yearly total-to-date growing	0.0	0.0	0.0	
	Monthly heating (18°C base)	972.2	825.8	886.2	
	Yearly total-to-date heating	1875.2	1610.5	1963.1	
	Monthly cooling (18°C base)	0.0	0.0	0.0	
	Yearly total-to-date cooling	0.0	0.0	0.0	
PRECIPITATION	Monthly total (mm)	19.0	7.2	13.3	43.7/1924$_{SE}$
	Yearly total-to-date (mm)	64.7	18.5	31.5	
	Greatest daily (mm/date)	6.7/23	2.5/04	14.2/1979/13	30.0/1962/03$_{SA}$
	Measurable precipitation days (≥ 0.2mm)	10	9	8.9	
WIND	Average monthly speed (km/h)	12.0	16.5	16.0	
	Peak gust (speed/direction/date)	56.9^{N}01	60.5^{NW}13		106^{N}1988/22$_{SA}$
RADIATION	Monthly bright sunshine (hours)	132.7	135.5	132.3	
	% possible bright sunshine	47.6	48.6	47.4	
	% normal bright sunshine	100.3	102.4		
	Bright Sunshine days	24	21	24.2	
	Monthly global radiation(MJ/m²)	216.5	210.4	210.1	
	Monthly diffuse radiation (MJ/m²)	115.0	101.8	105.3	
SOIL	Average temperature (°C) @ 9:00am grass level	2.4	-0.8		
	10 cm/20 cm	-1.6/-0.2	-2.6/-0.9	-6.7/-6.1	
	50 cm/100cm	-0.4/1.4	-0.8/1.2	-3.5/-0.8	
	150 cm/300cm	2.5/4.3	2.3/4.0	0.8/3.4	

Normals
Global and diffuse radiation = 1961-1990
Soil Temp. = 1971-2000 calculated by Env. Canada
Wind Normal and Extreme are from Saskatoon Airport

Saskatoon Stations
SM=interrupted readings (NWMP) about 1892-1900
SE= Eby (pioneer) 1901-41
SA= S'toon Airport 1942-Present

For Your Information

February was a month of contrasts. During the first half, temperatures were well below daily normals but on the 15th the temperatures rose dramatically from -31.1°C to above zero. By the end of the month, temperatures were again falling below seasonal values. The above average monthly snowfall of 19.0cm added an extra15cm to January's 21cm snow-on-the-ground measurement. This was cheered by cross-country ski enthusiasts and booed by snow shoveling home owners. Strong day time winds occurred twice during the month; on the 1st and again on the 23rd. Even though there were few strong winds during the month, the lesser winds still caused snow drifting problems on the roads. Bright sunshine hours, though normal for the month, were concentrated in the first half of the month. Seventy-six percent of the hours occurred during the first 15 days.

Bright sunshine was definitely available at noon on February 2nd for the groundhog to see its shadow predicting six more weeks of wintry weather for weary dwellers. But how accurate are its prognostications? It depends on who you ask. The Groundhog Day organizers boast that the rodents' forecasts are 75 to 90% accurate. However, a study of the meteorological records show the furry forecaster is only right 37 percent of the time; only 4 % higher than guessing.[1]

[1]Phillips, 1993

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Monthly Weather Summary

latitude 52°09'N Longitude 106°36'W asl 497 m Saskatoon

CRS estab. 1963

March 2007		2007 VALUE	2006 VALUE	NORMAL OR EXTREME FOR CRS 1971-2000	EXTREME FOR SASKATOON STATIONS
TEMPERATURE	Average monthly **maximum** (°C)	1.5	-2.8	-0.7	
	Extreme monthly maximum (°C/date)	12.2/23	11.1/28	20.0/1993/23	22.8/1910/23$_{SE}$
	Average monthly **minimum** (°C)	-8.9	-11.3	-10.5	
	Extreme monthly minimum (°C/date)	-24.4/15	-27.1/03	-38.9/1972/02	-43.3/1897/14$_{SM}$
	Monthly **average** (°C)	-3.7	-7.1	-5.6	
	No. of Frost-free days (Temp. > 0°C)	3	0	1.2	
DEGREE-DAYS	Monthly growing (5°C base)	1.4	0.0	2.4	
	Yearly total-to-date growing	1.4	0.0	2.4	
	Monthly heating (18°C base)	673.9	777.7	732.4	
	Yearly total-to-date heating	2549.1	2388.2	2695.5	
	Monthly cooling (18°C base)	0.0	0.0	0.0	
	Yearly total-to-date cooling	0.0	0.0	0.0	
PRECIPITATION	Monthly total (mm)	18.3	30.0	16.2	59.0/1927$_{SE}$
	Yearly total-to-date (mm)	83.0	48.5	47.7	
	Greatest daily (mm/date)	8.1/28	11.0/01	32.0/1967/30	32.0/1967/30$_{SRC}$
	Measurable precipitation days (≥ 0.2mm)	14	12	9.0	
WIND	Average monthly speed (km/h)	16.0	18.1	17.0	
	Peak gust (speed/direction/date)	54.8^{E}27	58.8^{ESE}17		93^{W}1959/18
RADIATION	Monthly bright sunshine (hours)	217.5	193.5	175.2	
	% possible bright sunshine	59.0	52.4	47.4	
	% normal bright sunshine	124.1	110.4		
	Bright Sunshine days	28	28	27.1	
	Monthly global radiation(MJ/m^2)	388.6	396.7	362.4	
	Monthly diffuse radiation (MJ/m^2)	167.0	206.4	173.9	
SOIL	Average temperature (°C) @ 9:00am grass level	5.0	2.9		
	10 cm/20 cm	-0.7/-0.2	-1.9/-0.7	-2.8/-2.4	
	50 cm/100cm	-0.5/0.9	-1.3/0.4	-1.5/-0.4	
	150 cm/300cm	1.9/3.4	1.5/3.2	0.6/2.7	

Saskatoon Stations
SM=interrupted readings (NWMP) about 1892-1900
SE= Eby (pioneer) 1901-41
SRC= SK Res. Council 1963-

Normals
Global and diffuse radiation = 1961-1990
Soil Temp. = 1971-2000 calculated by Env. Canada
Wind Normal and Extreme are from Saskatoon Airport

For Your Information

Above normal maximum and minimum March temperatures produced a monthly average of 1.9°C above normal. On the 24th, 25th and 31st, temperatures remained above 0°C. Only about 1/3 of the daily maximum temperatures were below freezing. Precipitation fell as rain and snow throughout the month. Snow-on-the-ground depth began the month at 35cm but, by month's end, the measurement was nil. Even the 4 metre snowbanks created by the snow ploughs at CRS had dwindled to almost nothing by the 31st. Fear of excessive flooding at the site, due to the combination of warm temperatures and deep snow pack, did not materialize. On the last day, a meadow lark was seen singing from the top of the Stevenson screen.

Spring floods, caused either by snowmelt runoff or heavy spring rains, can lead to ingenious coping methods. When heavy spring rains threatened to flood his home and 3 chicken barns in 2004, a Red River farmer hooked up his snow blower to the tractor and blew the water, for 12 straight hours, over a farm road that acted as a dike.[1]

[1]Phillips 2006

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Agriculture and Agri-Food Canada
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CAMPBELL SCIENTIFIC
Kipp & Zonen

Saskatchewan Research Council

Monthly Weather Summary

latitude 52°09'N Longitude 106°36'W asl 497 m Saskatoon

CRS estab. 1963

April 2007		2007 VALUE	2006 VALUE	NORMAL OR EXTREME FOR CRS 1971-2000	EXTREME FOR SASKATOON STATIONS
TEMPERATURE	Average monthly **maximum** (°C)	10.5	14.6	10.7	
	Extreme monthly maximum (°C/date)	22.7/28	25.1/29	31.5/2001/28	33.3/1952/28 SA US
	Average monthly **minimum** (°C)	-0.4	1.8	-1.7	
	Extreme monthly minimum (°C/date)	-13.4/06	-5.1/03	-27.8/1979/01	-30.5/1979/01 SWT
	Monthly **average** (°C)	5.0	8.2	4.5	
	No.of Frost-free days (Temp. > 0°C)	16	19	10.6	
DEGREE-DAYS	Monthly growing (5°C base)	98.1	116.3	61.3	
	Yearly total-to-date growing	99.5	116.3	63.7	
	Monthly heating (18°C base)	388.7	294.7	420.7	
	Yearly total-to-date heating	2937.8	2682.9	3116.2	
	Monthly cooling (18°C base)	0.0	0.0	0.3	
	Yearly total-to-date cooling	0.0	0.0	0.3	
PRECIPITATION	Monthly total (mm)	2.4	24.0	23.6	86.1/1955 US
	Yearly total-to-date (mm)	85.4	72.5	71.3	
	Greatest daily (mm/date)	1.0/17&18	11.0/01	24.6/1985/19	30.2/1955/19 US
	Measurable precipitation days (≥ 0.2mm)	4	8	8.4	
WIND	Average monthly speed (km/h)	16.1	14.5	18.0	
	Peak gust (speed/direction/date)	59.4 ESE 19	66.5 NW 13		108 W 1959/06
RADIATION	Monthly bright sunshine (hours)	262.1	300.4	225.2	
	% possible bright sunshine	62.7	71.8	53.8	
	% normal bright sunshine	116.4	133.4		
	Bright Sunshine days	29	29	27.3	
	Monthly global radiation(MJ/m²)	506.5	554.6	492.2	
	Monthly diffuse radiation (MJ/m²)	197.5	162.3	178.5	
SOIL	Average temperature (°C) @ 9:00am grass level	11.2	14.0		
	10 cm/20 cm	1.5/1.3	2.7/3.6	3.6/4.0	
	50 cm/100cm	1.0/1.6	1.3/1.5	3.0/1.6	
	150 cm/300cm	2.0/3.0	1.6/2.8	1.5/2.4	

Saskatoon Stations
SA= S'toon Airport 1942-
US= Univ. of SK 1915-64
SWT= S'toon Water Treatment Plant 1974-

Normals
Global and diffuse radiation = 1961-1990
Soil Temp. = 1971-2000 calculated by Env. Canada
Wind Normal and Extreme are from Saskatoon Airport

For Your Information

If 'April showers brings forth May flowers' then very few flowers should be expected this May. April's record low precipitation at 2.4mm easily defeats April1988 and April 1989 when 3.5mm were recorded. However, due to the heavy snowfall in the first part of the year, the cummulative precipitation to the end of April is 14mm above normal. The occasional blustery day highlighted the dry conditions. Afternoon winds between 40 and 60 km/h, on the 18th, 19th, and 28th and morning winds on the 30th, created unpleasant conditions with blowing debris. The average monthly temperature, 0.5°C above normal, was due to higher daily minimum temperatures and not due to higher daily maximum temperatures. April experienced 20 days with daily minimum temperatures higher than their daily normal. There were 16 frost-free days; well above the normal 10 days. As would be expected with the lack of precipitation days, bright sunshine hours were well above normal.

Spring floods can cause massive damage in a very short time as witnessed on April 6th, 1952. Three steel centre spans of the newly erected Saskatchewan Landing Bridge, weighing 100s of tonnes, disappeared without a trace in about 15 seconds. A flood crest piled with ice cakes and boulders hit the bridge and in three days the bridge's destruction was totally completed.[1] [1]Phillips 2006

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latitude 52°09'N Longitude 106°36'W asl 497 m Saskatoon

CRS estab. 1963

May 2007		2007 VALUE	2006 VALUE	NORMAL OR EXTREME FOR CRS 1971-2000	EXTREME FOR SASKATOON STATIONS
TEMPERATURE	Average monthly **maximum** (°C)	18.3	18.5	18.6	
	Extreme monthly maximum (°C/date)	26.5/17	32.3/22	35.0/1988/30	37.2/1936/27$_{SE}$
	Average monthly **minimum** (°C)	5.5	6.5	4.7	
	Extreme monthly minimum (°C/date)	-0.6/10	-3.0/04	-10.0/1967/02	-12.8/1907/06$_{SE}$
	Monthly **average** (°C)	11.9	12.5	11.6	
	No. of Frost-free days (Temp. > 0°C)	30	30	25.6	
DEGREE-DAYS	Monthly growing (5°C base)	214.4	237.7	211.6	
	Yearly total-to-date growing	313.9	354.0	275.3	
	Monthly heating (18°C base)	189.4	180.3	204.4	
	Yearly total-to-date heating	3127.2	2863.2	3320.6	
	Monthly cooling (18°C base)	0.8	10.9	7.4	
	Yearly total-to-date cooling	0.8	10.9	7.7	
PRECIPITATION	Monthly total (mm)	44.0	47.8	44.3	178.0/1977$_{SWT}$
	Yearly total-to-date (mm)	129.4	120.3	115.6	
	Greatest daily (mm/date)	15.0/29	17.4/09	39.9/1985/04	59.0/1999/18$_{SA}$
	Measurable precipitation days (≥ 0.2mm)	12	16	9.8	
WIND	Average monthly speed (km/h)	17.1	16.5	18.0	
	Peak gust (speed/direction/date)	71.2^{NW}12	56.7^{W}30		132^{SW}1965/17$_{SA}$
RADIATION	Monthly bright sunshine (hours)	267.0	238.4	267.1	
	% possible bright sunshine	54.8	48.9	54.7	
	% normal bright sunshine	100.0	89.3		
	Bright Sunshine days	29	24	29.5	
	Monthly global radiation(MJ/m^2)	587.7	544.6	586.3	
	Monthly diffuse radiation (MJ/m^2)	213.0	210.1	222.2	
SOIL	Average temperature (°C) @ 9:00am — grass level	19.1	18.8		
	10 cm/20 cm	7.8/8.6	8.7/10.0	10.8/11.3	
	50 cm/100cm	8.0/6.5	8.2/6.7	9.3/6.4	
	150 cm/300cm	5.3/3.9	5.4/3.7	4.8/3.4	

Saskatoon Stations
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Normals
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Soil Temp. = 1971-2000 calculated by Env. Canada
Wind Normal and Extreme are from Saskatoon Airport

For Your Information

If a month can be said to be normal, then May 2007 was a normal month. The temperature averages were within one degree of their normals with the range from a low of -0.6°C to a high of 26.5°C. The last spring frost was recorded on the 10th; 8 days earlier than the normal last spring frost day of May 18th. Rainfall was slightly less than normal with the 9 of the 12 precipitation days occurring in the latter half of the month. Two rainfall events, on the 12th and 29th, provided 58% of the monthly total. Average wind speeds were normal with an upper extreme of 71.2 km/h recorded on the 12th during the rainstorm. Seventeen days recorded winds over 40 km/h; eleven days recording winds of this magnitude for four or more consecutive hours. Bright sunshine hours were only 1/10 of an hour less than normal with all but two days recording some bright sunshine.

Bright sunshine was conspicuously absent for Her Majesty's visit to Alberta during the centennial year 2005. Chilly rains, accompanied by gusty winds and 15,000 hardy Edmontonians greeted the Queen as she cut the centennial cake at Commonwealth Stadium. Due to a strong gust of wind, Premier Klein was almost involved in a Royal Faux Pas when his umbrella missed poking Her Royal Highness in Her Royal face and instead knocked The Royal Hat nearly off.[1] [1]Phillips 2006

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CRS estab. 1963

	June 2007	2007 VALUE	2006 VALUE	NORMAL OR EXTREME FOR CRS 1971-2000	EXTREME FOR SASKATOON STATIONS
TEMPERATURE	Average monthly **maximum** (°C)	22.2	22.7	22.6	
	Extreme monthly maximum (°C/date)	29.5/02	33.5/28	41.0/1988/05	41.5/1988/06$_{S2}$
	Average monthly **minimum** (°C)	9.4	11.4	9.5	
	Extreme monthly minimum (°C/date)	2.7/07	4.8/13	-3.3/1967/06	-3.9/1917/02$_{US}$
	Monthly **average** (°C)	15.8	17.1	16.0	
	No.of Frost-free days (Temp. > 0°C)	30	30	29.9	
DEGREE-DAYS	Monthly growing (5°C base)	325.1	362.3	331.5	
	Yearly total-to-date growing	639.0	716.3	606.8	
	Monthly heating (18°C base)	77.0	55.2	82.8	
	Yearly total-to-date heating	3204.2	2918.4	3403.4	
	Monthly cooling (18°C base)	12.1	27.5	22.3	
	Yearly total-to-date cooling	12.9	38.4	30.0	
PRECIPITATION	Monthly total (mm)	109.4	105.8	59.5	186.8/1942$_{S}$
	Yearly total-to-date (mm)	238.8	226.1	175.1	
	Greatest daily (mm/date)	68.0/17	35.0/17	99.4/1983/24	99.4/1983/24$_{SRC}$
	Measurable precipitation days (≥ 0.2mm)	10	14	12.5	
WIND	Average monthly speed (km/h)	15.5	13.7	17.0	
	Peak gust (speed/direction/date)	72.7^{N}18	57.3^{NE}14		117^{S}1986/01$_{SA}$
RADIATION	Monthly bright sunshine (hours)	314.7	252.2	277.2	
	% possible bright sunshine	62.9	50.4	55.4	
	% normal bright sunshine	113.5	91.0		
	Bright Sunshine days	29	26	28.5	
	Monthly global radiation(MJ/m^2)	662.5	566.8	638.7	
	Monthly diffuse radiation (MJ/m^2)	226.7	210.7	228.1	
SOIL	Average temperature (°C) @ 9:00am — grass level	23.1	22.7		
	10 cm/20 cm	11.8/12.4	12.7/13.9	15.7/16.3	
	50 cm/100cm	11.8/9.8	11.8/10.0	14.0/10.4	
	150 cm/300cm	8.2/5.8	8.4/5.8	8.3/5.4	

Saskatoon Stations
SA= S'toon Airport 1942-
US= Univ. of SK 1915-64
SRC= SK Res. Council 1963-
S= Saskatoon 1941-42
S2=Saskatoon 2 1977-90

Normals
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calculated by Env. Canada
Wind Normal and Extreme are from Saskatoon Airport

For Your Information

June recorded the eighth highest monthly precipitation at CRS since 1964. The record monthly precipitation of 171.0mm was recorded in 2005. The intense, daily record rainfall during the afternoon and evening of the 17th continued into the morning of the 18th and contributed over 75% of the monthly total. On the 17th a new daily record was set; the 68.0mm recorded easily flooded out the old record of 35.0mm set last year. The Saskatoon Airport recorded 19.6mm more precipitation for the two days than at CRS.[1] Around the Saskatoon area the amounts varied from a high of 290mm north of Martensville to a low of 47mm, 11 km southeast of the city as measured by SRC colleagues. Temperature means were near normal for the month but bright sunshine was 13.5% above normal with only one day not recording any bright sunshine. Fifteen days recorded winds over 40 km/h including eight days over 50 km/h and one day over 63km/h.

Last year, the weather systems that brought copious amounts of June rain to Alberta also brought the biggest butterfly boom in 20 years. Up to 100 times more of the "Painted Lady" species were recorded in some parts of the province due to the southern flow of air.[2]

[1] Environment Canada, 2007a [2] Phillips 2006

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CRS estab. 1963

	July 2007	2007 VALUE	2006 VALUE	NORMAL OR EXTREME FOR CRS 1971-2000	EXTREME FOR SASKATOON STATIONS
TEMPERATURE	Average monthly **maximum** (°C)	28.5	27.6	24.8	
	Extreme monthly maximum (°C/date)	37.1/23	33.2/23	39.3/ 2001/05	40.0/1919/17&1941/19&1946/30 SE/USSA
	Average monthly **minimum** (°C)	15.0	14.3	11.5	
	Extreme monthly minimum (°C/date)	8.7/10	9.8/03	1.7/1967/02&1978/09	-0.6/1918/25 SE
	Monthly **average** (°C)	21.8	21.0	18.2	
	No. of Frost-free days (Temp. > 0°C)	31	31	31	
DEGREE-DAYS	Monthly growing (5°C base)	519.5	495.1	408.4	
	Yearly total-to-date growing	1158.5	1211.4	1015.2	
	Monthly heating (18°C base)	9.1	2.7	35.3	
	Yearly total-to-date heating	3213.3	2921.1	3438.7	
	Monthly cooling (18°C base)	125.6	94.8	40.7	
	Yearly total-to-date cooling	138.5	133.2	70.7	
PRECIPITATION	Monthly total (mm)	16.4	39.8	58.0	162.9/1928 SE
	Yearly total-to-date (mm)	255.2	265.9	233.1	
	Greatest daily (mm/date)	8.8/09	7.8/29	45.5/1968/29	79.2/1946/03 US
	Measurable precipitation days (≥ 0.2mm)	8	11	12.0	
WIND	Average monthly speed (km/h)	12.6	12.8	16.0	
	Peak gust (speed/direction/date)	82.3W21	85.8WNW07		113E1955/05 SA
RADIATION	Monthly bright sunshine (hours)	383.7	376.1	305.7	
	% possible bright sunshine	76.4	74.9	61.0	
	% normal bright sunshine	125.5	123.0		
	Bright Sunshine days	31	31	30.3	
	Monthly global radiation(MJ/m²)	733.0	760.8	633.5	
	Monthly diffuse radiation (MJ/m²)	170.4	177.8	216.5	
SOIL	Average temperature (°C) @ 9:00am — grass level	28.1	28.9		
	10 cm/20 cm	16.7/16.9	16.7/18.1	18.0/18.9	
	50 cm/100cm	16.0/13.3	16.2/13.7	16.7/13.1	
	150 cm/300cm	11.3/7.9	11.6/8.0	10.9/7.5	

Saskatoon Stations

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Normals

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For Your Information

This July was the hottest ever recorded at CRS. Saskatoon has not seen average monthly temperatures this high for 60 years when July 1947 recorded the same monthly average temperature. It was 71 years ago in 1936, when the average temperature of 22.0°C was higher than the 21.8°C recorded at CRS this year.[1] Ten days recorded maximum temperatures over 30°C with seven days grouping to form two heat waves; from the 22nd to the 24th and from the 27th to the 30th. On the 23rd and 30th, new daily maximum records were set; 37.1°C and 36.3°C respectively. Not only was the month extremely hot, it was also very bright as every day recorded bright sunshine. Of the daily bright sunshine available for recording, 12 days recorded over 90% of the possible daily bright sunshine. Only July 1974, with 386.2 hours, had a monthly bright sunshine total greater than this year 383.7 hours. Unfortunately, the scorching weather did not bring precipitation. The monthly precipitation was only 28% of normal.

Although Saskatoon suffered through the extreme hot temperatures, there were no reports of enterprising thieves stealing ice. In 2005, Renfrew Ontario police kept a sharp eye peeled for 100 plastic ice bags stolen from a restaurant cooler. They knew the evidence was long gone in the 33°C heat but hoped the large quantity of bags would give the thieves away.[2]

[1] Environment Canada, 2007b. [2] Phillips 2006

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CRS estab. 1963

	August 2007	2007 VALUE	2006 VALUE	NORMAL OR EXTREME FOR CRS 1971-2000	EXTREME FOR SASKATOON STATIONS
TEMPERATURE	Average monthly **maximum** (°C)	22.7	26.5	24.6	
	Extreme monthly maximum (°C/date)	33.3/07	34.7/29	39.7/1998/06	39.7/1998/06 SRC
	Average monthly **minimum** (°C)	10.6	11.9	10.4	
	Extreme monthly minimum (°C/date)	4.7/24	7.2/26	-2.8/1976/28	-2.8/1901/23&1976/28 SM SRC
	Monthly **average** (°C)	16.7	19.3	17.5	
	No.of Frost-free days (Temp. > 0°C)	31	31	30.8	
DEGREE-DAYS	Monthly growing (5°C base)	362.2	441.8	387.8	
	Yearly total-to-date growing	1520.7	1653.2	1403.0	
	Monthly heating (18°C base)	70.6	17.6	57.7	
	Yearly total-to-date heating	3283.9	2938.7	3496.4	
	Monthly cooling (18°C base)	29.8	56.4	42.5	
	Yearly total-to-date cooling	168.3	189.6	113.2	
PRECIPITATION	Monthly total (mm)	105.2	38.2	36.2	178.9/1954 NRC
	Yearly total-to-date (mm)	360.2	304.1	269.3	
	Greatest daily (mm/date)	48.2/17	15.6/11	33.8/1998/17	84.3/1945/03 SA
	Measurable precipitation days (≥ 0.2mm)	13	10	9.8	
WIND	Average monthly speed (km/h)	15.6	13.8	16.0	
	Peak gust (speed/direction/date)	60.4W20	87.7WNW04		151W1967/14 SA
RADIATION	Monthly bright sunshine (hours)	242.4	333.4	280.8	
	% possible bright sunshine	53.5	73.7	62.1	
	% normal bright sunshine	86.3	118.7		
	Bright Sunshine days	30	31	30.1	
	Monthly global radiation(MJ/m²)	499.3	605.6	529.0	
	Monthly diffuse radiation (MJ/m²)	182.7	176.6	185.6	
SOIL	Average temperature (°C) @ 9:00am — grass level	21.2	24.3		
	10 cm/20 cm	13.2/14.0	15.0/16.7	16.9/18.1	
	50 cm/100cm	15.1/13.8	15.7/14.1	16.8/14.1	
	150 cm/300cm	12.5/9.8	12.9/9.8	12.3/9.1	

Saskatoon Stations
SM=interrupted readings (NWMP) about 1892-1901
SA= S'toon Airport 1942-
NRC= Nat. Res. Council 1952-66
SRC= SK Res. Council 1963-

Normals
Global and diffuse radiation = 1961-1990
Soil Temp. = 1971-2000 calculated by Env. Canada
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For Your Information

August will be remembered for deluges and cool temperatures. On the 17th, daily and monthly records were set when 48.2mm of rain were measured over a nine hour period. Over half, 28.8mm, fell between 7 and 8 pm causing flooding. Just as Saskatoonians were mopping up from this intense rain storm, another hit the morning of the 19th with 32.0mm. By the end of the month, Saskatoon had received almost twice the normal amount of rain. CRS has now recorded more than the normal amount of precipitation it usually receives for the total year. Understandably, with 13 days of rain, bright sunshine values were 38.4 hours below normal. Cool daytime temperatures were the major contributor to the below average monthly mean. Temperatures of 27°C or more only occurred eight times.

Although the complaints about the cool weather August were numerous, they could not compare with 1816; 'The Year Without a Summer'. The unusual weather was caused by volcanic eruptions of Mount Tambora in present day Indonesia which ejected immense amounts of volcanic dust into the upper atmosphere. Temperatures fell worldwide because less sunlight passed through the atmosphere. Adino Brackett of New England expressed the feelings of many in his final entry of 1816: *"This past summer and fall have been so cold and miserable that I have from despair kept no account of the weather."* [1]

[1]Heidorn 2004 and Wikipedia 2007

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	September 2007	2007 VALUE	2006 VALUE	NORMAL OR EXTREME FOR CRS 1971-2000	EXTREME FOR SASKATOON STATIONS
TEMPERATURE	Average monthly **maximum** (°C)	17.8	18.9	18.1	
	Extreme monthly maximum (°C/date)	29.9/04	31.3/04&06	35.6/1978/04	35.6/1978/04$_{SRC}$
	Average monthly **minimum** (°C)	5.2	6.9	4.9	
	Extreme monthly minimum (°C/date)	-2.2/30	-1.3/19	-7.8/1974/30	-11.1/1908/28$_{SE}$
	Monthly **average** (°C)	11.5	12.9	11.6	
	No. of Frost-free days (Temp. > 0°C)	28	29	25.6	
DEGREE-DAYS	Monthly growing (5°C base)	195.5	238.5	203.5	
	Yearly total-to-date growing	1716.2	1891.7	1606.5	
	Monthly heating (18°C base)	199.6	161.7	198.9	
	Yearly total-to-date heating	3483.5	3100.4	3695.3	
	Monthly cooling (18°C base)	5.1	9.7	5.8	
	Yearly total-to-date cooling	173.4	199.3	119.0	
PRECIPITATION	Monthly total (mm)	18.6	128.4	29.4	128.4/2006$_{SRC}$
	Yearly total-to-date (mm)	379.0	432.5	298.7	
	Greatest daily (mm/date)	5.6/23	52.4/15	52.4/2006/15	44.2/1931/12$_{US}$
	Measurable precipitation days (≥ 0.2mm)	13	14	8.4	
WIND	Average monthly speed (km/h)	13.4	14.3	17.0	
	Peak gust (speed/direction/date)	60.0^{NW}/26	57.2^{NE}/15		148^{W}/1967/22$_{SA}$
RADIATION	Monthly bright sunshine (hours)	209.0	204.8	186.0	
	% possible bright sunshine	55.1	54.0	49.1	
	% normal bright sunshine	112.4	110.1		
	Bright Sunshine days	27	23	27.0	
	Monthly global radiation(MJ/m^2)	355.6	343.0	351.8	
	Monthly diffuse radiation (MJ/m^2)	137.8	109.7	127.6	
SOIL	Average temperature (°C) @ 9:00am — grass level	14.7	17.2		
	10 cm/20 cm	8.5/9.9	10.1/12.0	11.0/12.5	
	50 cm/100cm	11.8/12.0	12.6/12.7	13.2/12.4	
	150 cm/300cm	11.7/10.3	12.3/10.6	11.7/9.9	

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The 2007 growing season officially ended at CRS on September 14th when the temperature dipped to 0°C. The frost-free season length totalled 126 days; 9 days more than the normal of 117 days. Temperature averages for the monthly maximum and minimum were within one degree of their September normals. This is reflected in the degree-day totals also being very close to their normal values. Precipitation was 63.3% of normal but the total for the year is still above normal at 27%. Monthly bright sunshine value was 23 hours or 12% above normal. Winds were low throughout most of September with an extreme gust of 60 km/h from the northwest occurring on the 26th.

On September 16th, 1841, the residents near Dunfermline, just west of Saskatoon, were amazed when fish, from 5 to 9cm in length, fell from the clouds after a severe thundershower. Although they must have fallen a considerable distance, many were alive after the fall, jumping in the grass.[1]

[1] Phillips 2006

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CRS estab. 1963

October 2007		2007 VALUE	2006 VALUE	NORMAL OR EXTREME FOR CRS 1971-2000	EXTREME FOR SASKATOON STATIONS
TEMPERATURE	Average monthly **maximum** (°C)	11.9	6.9	10.8	
	Extreme monthly maximum (°C/date)	22.4/24	21.6/05	28.5/1980/06&1984/08	32.2/1943/05$_{SAUS}$
	Average monthly **minimum** (°C)	0.4	-2.2	-1.3	
	Extreme monthly minimum (°C/date)	-9.2/27	-8.7/22	-21.5/1991/29,30	-25.6/1919/26$_{SEUS}$
	Monthly **average** (°C)	6.2	2.4	4.8	
	No of Frost-free days (Temp. > 0°C)	18	9	11.6	
DEGREE-DAYS	Monthly growing (5°C base)	61.7	35.7	63.7	
	Yearly total-to-date growing	1777.9	1927.4	1670.2	
	Monthly heating (18°C base)	366.4	485.0	410.2	
	Yearly total-to-date heating	3849.9	3585.4	4105.5	
	Monthly cooling (18°C base)	0.0	0.0	0.1	
	Yearly total-to-date cooling	173.4	199.3	119.1	
PRECIPITATION	Monthly total (mm)	12.2	44.0	16.4	69.8/1969$_{SRC}$
	Yearly total-to-date (mm)	391.2	476.5	315.1	
	Greatest daily (mm/date)	9.2/11	26.4/07	36.7/1984/16	41.7/1924/12&1969/03$_{NASA}$
	Measurable precipitation days (≥ 0.2mm)	11	11	6.3	
WIND	Average monthly speed (km/h)	14.1	14.1	17.0	
	Peak gust (speed/direction/date)	56.9^{WNW}25	77.4^{WNW}26		138^{NW}1967/16$_{SA}$
RADIATION	Monthly bright sunshine (hours)	190.8	165.7	157.9	
	% possible bright sunshine	57.9	50.3	48.0	
	% normal bright sunshine	120.8	104.9		
	Bright Sunshine days	28	25	27.0	
	Monthly global radiation(MJ/m²)	239.9	235.7	239.1	
	Monthly diffuse radiation (MJ/m²)	88.9	96.1	92.6	
SOIL	Average grass level	8.6	6.4		
	temperature (°C) 10 cm/20 cm	3.5/5.0	2.9/4.9	4.7/6.2	
	@ 9:00am 50 cm/100cm	7.5/9.1	6.9/8.6	8.3/9.2	
	150 cm/300cm	9.6/9.7	9.5/9.9	9.6/9.4	

Saskatoon Stations
SE= Eby (pioneer) 1901-41
SA= S'toon Airport 1942-
US= Univ. of SK 1915-64
SRC= SK Res. Council 1963-

Normals
Global and diffuse radiation = 1961-1990
Soil Temp. = 1971-2000 calculated by Env. Canada
Wind Normal and Extreme are from Saskatoon Airport

For Your Information

October was bright and sunny with almost 33 hours more bright sunshine than normal. This, coupled with above normal temperatures, encouraged everyone to be outside completing fall chores or just taking long walks admiring the autumn colours. The above normal temperatures are reflected in the below normal heating degree-days. Precipitation, 4.2 mm below normal, was recorded on 11 days. Of the 12.2 mm recorded for the month, 9.2 were measured on October 11th. Snow was observed on the 26th but melted soon after contact with the ground. Only nine days experienced winds above 40 km/h with the strongest gust occurring on the 25th at 56.9 km/h.

It does not take very high winds to make life unpleasant. Shortly before noon, on October 25th, 1955, Calgarians experienced 60 km/h winds which sent dust clouds sweeping through the city. In the city centre, pedestrians walked with heads bowed and eyes half-shut against dust and sand and avoided the metal "No Parking" signs which were blowing off the curbs.[1] Such events were not reported in Saskatoon this year on October 25th.

[1]Philips 2006

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Monthly Weather Summary

latitude 52°09'N Longitude 106°36'W asl 497 m Saskatoon

CRS estab. 1963

November 2007		2007 VALUE	2006 VALUE	NORMAL OR EXTREME FOR CRS 1971-2000	EXTREME FOR SASKATOON STATIONS
TEMPERATURE	Average monthly **maximum** (°C)	-0.3	-3.2	-1.4	
	Extreme monthly maximum (°C/date)	11.3/12	6.9/05	19.4/1975/04	21.7/1903/03$_{SE}$
	Average monthly **minimum** (°C)	-8.9	-13.0	-10.3	
	Extreme monthly minimum (°C/date)	-24.9/26	-25.7/30	-33.5/1985/24	-39.4/1893/30$_{SM}$
	Monthly **average** (°C)	-4.6	-8.1	-5.9	
	No. of Frost-free days (Temp. > 0°C)	1	0	1.2	
DEGREE-DAYS	Monthly growing (5°C base)	0.2	0.0	2.6	
	Yearly total-to-date growing	1778.1	1927.4	1672.8	
	Monthly heating (18°C base)	678.4	783.5	715.8	
	Yearly total-to-date heating	4528.3	4368.9	4821.3	
	Monthly cooling (18°C base)	0.0	0.0	0.0	
	Yearly total-to-date cooling	173.4	199.3	119.1	
PRECIPITATION	Monthly total (mm)	14.5	31.0	14.8	57.3/1940$_{SE}$
	Yearly total-to-date (mm)	405.7	507.5	329.9	
	Greatest daily (mm/date)	5.8/18	15.4/08	19.3/1978/04	27.9/1938/01$_{US}$
	Measurable precipitation days (≥ 0.2mm)	12	13	7.9	
WIND	Average monthly speed (km/h)	16.4	16.5	16.0$_{SA}$	
	Peak gust (speed/direction/date)	68.4^{WNW}13	59.3^{NW}16		100^{W}1976/17$_{SA}$
RADIATION	Monthly bright sunshine (hours)	107.6	101.3	98.0	
	% possible bright sunshine	40.7	38.4	37.2	
	% normal bright sunshine	109.8	103.4		
	Bright Sunshine days	21	22	22.2	
	Monthly global radiation(MJ/m^2)	117.5	123.3	123.7	
	Monthly diffuse radiation (MJ/m^2)	59.1	69.2	73.6	
SOIL	Average temperature (°C) @ 9:00am — grass level	1.5	0.1		
	10 cm/20 cm	-1.1/0.7	-0.7/1.1	-1.7/-0.5	
	50 cm/100cm	3.2/5.8	2.3/4.8	3.0/5.6	
	150 cm/300cm	7.1/8.4	6.1/8.1	6.8/8.1	

Saskatoon Stations
SM=interrupted readings (NWMP) about 1892-1900
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SA= S'toon Airport 1942-
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Normals
Global and diffuse radiation = 1961-1990
Soil Temp. = 1971-2000 calculated by Env. Canada
Wind Normal and Extreme are from Saskatoon Airport

For Your Information

After enjoying a prolonged warm autumn, winter daytime temperatures arrived on the 20th. Up until then, temperatures had ranged from 11°C to -1°C during the day. Nighttime temperatures, for this period, were below freezing but in the single digits. For the last five days of November, the mean daily temperature plunged to around -20°C. During the first half of the month, hourly wind speeds were frequently recorded above 40 km/h. Less frequent high wind speeds in the latter half of the month were a relief when the colder temperatures arrived at the end of the month. Precipitation fell as both rain and snow producing a near normal total of 14.5mm. By months end, an average of 12cm of snow was measured on the ground. Twenty-one days recorded some bright sunshine producing 9.8% more hours than normal, even with 12 days recording less than one hour of bright sunshine.

November 25th of this year will be remembered by Saskatchewan football fans as a great day when the Grey Cup returned home to the province. One year ago, to the day, in Saskatoon, 13,000 college football fans braved wind chills of -30 C to watch the Vanier cup awarded to Laval who defeated Saskatchewan 13 – 8. [1,2]

[1]Heidom 2007 [2]Canadian Interuniversity Sport nd

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Monthly Weather Summary

latitude 52°09'N Longitude 106°36'W asl 497 m Saskatoon

CRS estab. 1963

December 2007		2007 VALUE	2006 VALUE	NORMAL OR EXTREME FOR CRS 1971-2000	EXTREME FOR SASKATOON STATIONS
TEMPERATURE	Average monthly **maximum** (°C)	-10.9	-4.4	-9.0	
	Extreme monthly maximum (°C/date)	-2.1/24	4.6/15	11.2/1997/14	14.4/1939/05$_{SE}$
	Average monthly **minimum** (°C)	-17.7	-14.0	-18.6	
	Extreme monthly minimum (°C/date)	-26.8/08	-28.2/02	-42.2/1973/31	-43.9/1892/22$_{SM}$
	Monthly **average** (°C)	-14.3	-9.2	-13.9	
	No.of Frost-free days (Temp. > 0°C)	0	0	0.2	
DEGREE-DAYS	Monthly growing (5°C base)	0.0	0.0	0.1	
	Yearly total-to-date growing	1778.1	1927.4	1672.9	
	Monthly heating (18°C base)	1001.2	844.2	987.7	
	Yearly total-to-date heating	5529.5	5213.1	5809.0	
	Monthly cooling (18°C base)	0.0	0.0	0.0	
	Yearly total-to-date cooling	173.4	199.3	119.1	
PRECIPITATION	Monthly total (mm)	8.2	10.0	18.3	59.2/1956$_{SA}$
	Yearly total-to-date (mm)	413.9	517.5	348.2	
	Greatest daily (mm/date)	2.4/12	4.0/13	14.5/1973/23	28.4/1936/02$_{SE}$
	Measurable precipitation days (≥ 0.2mm)	11	10	11.4	
WIND	Average monthly speed (km/h)	12.2	14.2	16.0	
	Peak gust (speed/direction/date)	47.3^{WNW}21	57.4^{WNW}16		121^{W}1955/12$_{SA}$
RADIATION	Monthly bright sunshine (hours)	85.0	123.3	85.4	
	% possible bright sunshine	35.1	50.9	35.2	
	% normal bright sunshine	99.5	144.4		
	Bright Sunshine days	23	27	22.8	
	Monthly global radiation(MJ/m^2)	96.2	104.4	95.2	
	Monthly diffuse radiation (MJ/m^2)	55.3	52.5	54.3	
SOIL	Average temperature (°C) @ 9:00am — grass level	-1.3	3.0		
	10 cm/20 cm	-3.3/-1.4	-0.7/0.8	-6.6/-5.6	
	50 cm/100cm	-0.3/2.5	0.9/3.1	-1.7/2.0	
	150 cm/300cm	4.1/6.5	4.3/6.1	3.8/6.4	

Saskatoon Stations
SM=interrupted readings (NWMP) about 1892-1900
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Normals
Global and diffuse radiation = 1961-1990
Soil Temp. = 1971-2000 calculated by Env. Canada
Wind Normal and Extreme are from Saskatoon Airport

For Your Information

December extreme temperatures ranged from a high of -2.1° to a low of -26.8°C. The monthly averages were near normal with the monthly maximum 1.9°C below normal and the monthly minimum 0.9° above normal. Days around December 25th felt balmy with temperatures near zero. A dusting of snow and frost created picturesque landscapes for the holidays. By the end of the month, only 15cm of snow-on-the-ground were measured at the climate station. Normal amounts of bright sunshine and a general lack of winds over 40 km/h greeted outdoor enthusiasts as they headed for the toboggan hills and ski courses in the city. Snowmen popped up in front yards like mushrooms.

Kenaston on Highway 11, between Saskatoon and Regina, boasts as being the blizzard capital of Saskatchewan. To celebrate this dubious achievement, the town's people have erected an 18 foot tall "all weather" snowman, complete with top hat and snow shovel.[1]

[1]Beaulieu, 2007

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INSTRUMENTS USED AT SASKATOON SRC CRS AND GLOSSARY OF TERMS

(Unless otherwise stated, source for definitions of terms is Environment Canada, 1978)

BEAUFORT WIND SCALE was developed by Admiral Sir Francis Beaufort in 1805 and adopted by the British Navy in 1838. It consisted of 13 degrees of wind strength, from calm to hurricane, based upon the effects of various wind strengths upon the amount of canvas carried by the fully rigged frigates of the period. Over the years it has been modified as needed and in 1946 the scale values (Force Numbers) were defined by ranges of wind speed as measured at a height of 10 meters above the surface. In effect, this transformed the 'Beaufort Wind Force Scale' into the 'Beaufort Wind Speed Scale'. This scale is the current standard scale for visual observations of the wind (Heidorn, 1998).

BRIGHT SUNSHINE is the unobstructed direct radiation from the sun, as opposed to the shading of a location by clouds or by other atmospheric obstructions.

Number of Days is defined as the total number of days when at least 0.1 of an hour of bright sunshine was recorded.

Percentage Possible refers to the ratio of measured bright sunshine hours to the total possible daylight hours in a given period, expressed as a percentage.

Possible daylight hours are taken from the sunrise/set tables provided by the National Research Council of Canada, Herzberg Institute of Astrophysics, Victoria, BC.

Total is the sum of the daily bright sunshine values in hours and tenths of hours as measured by an automated sunshine recorder using voltaic cells.

DEGREE-DAY is an index for various temperature related calculations

Cooling (CDD) is the cooling requirement to achieve a stipulated comfort value in an indoor environment. For most purposes, a temperature of greater than 18°C is considered uncomfortable and supplementary cooling is required. On a specific day, the amount by which 18°C is less than the daily average temperature defines the number of cooling degree-days for that day.

Mathematically:

CDD = (T - 18°C), for that day, where T = daily mean temperature in °C if T is equal to or less than 18°C, CDD = 0.

Monthly and annual values of CDD are obtained by summing daily values.

Growing (GDD) is the growing requirement in order for plant growth to proceed. The air temperature must exceed a critical value appropriate to the plant species in question. For many members of the grass family, including most commercial cereals grown on the prairies, a base temperature of 5.0°C has been established. On a specified day, the difference between the daily average temperature and the 5.0°C base temperature defines the number of growing degree-days.

Mathematically:

GDD = (T - 5.0°C), for that day, where T = daily mean temperature in °C if T is equal to or less than 5.0°C, GDD = 0.

Daily GDD values are summed to provide totals for the appropriate month, growing season or year.

Heating (HDD) is the heating requirement to achieve a stipulated comfort value in an indoor environment. For most purposes, a temperature of less than 18°C is considered uncomfortable and supplementary heating is required. On a specific day, the amount by which 18°C exceeds the daily average temperature defines the number of heating degree-days for that day.

Mathematically:

HDD = (18°C - T), for that day, where T = daily mean temperature in °C if T is equal to or greater than 18°C, HDD = 0.

Monthly and annual values of HDD are obtained by summing daily values.

EXTREME is the highest or lowest value of a particular element recorded during the period in question.

EXTREME ALL YEARS Temporal comparisons at a point are also of value in some types of climatic studies. Therefore, it is desirable to produce the maximum length of reliable climatic record to carry out studies over a period of time. Data are drawn from the following data sets:
Saskatoon, SRC:1963 to present
Saskatoon, University of Saskatchewan:1916 to 1963
Saskatoon, City:1892 to present
Station locations, exposures and measurement procedures were subject to change during this time period. Data are not adjusted and users are cautioned accordingly.

FROST is recorded on each occasion when the daily minimum temperature is equal to or less than 0°C.

NORMAL VALUE (1971-2000) In climatology it is often useful to make spatial comparisons of particular element values over a common time period. At an interior continental site such as Saskatoon, a period of 30 years is required to produce statistically stable estimates of the more variable elements. To facilitate spatial comparisons, the World Meteorological Organization recommends the standard normal (average) period of thirty years. The current normal period for data analysis at CRS is from January 1st, 1971 to December 31st, 2000. Data derived from CRS conform to this standard, except where noted. The normals for CRS have been calculated using the data collected during this standard period. Where gaps existed, data from the nearest climate station were used and referenced as to being used.

POTENTIAL EVAPOTRANSPIRATION (Thornthwaite Method) is the amount of water which will be lost from a surface completely covered with vegetation if there is sufficient water in the soil at all times for the use of the vegetation. It is computed by means of an empirical formula involving mean monthly temperature and average length of day.
Mathematically:
$PET = mT^a$ where PET = Potential of Evaportranspiration; m = % of day length for the month as compared to the year; T = Temperature °C when T is less than or equal to 0; otherwise T = O; and a = yearly heat index. (Thornthwaite and Mather, 1955)

PRECIPITATION

Day is recorded on occasions when the amount of precipitation in a 24-hour period equals or exceeds 0.2 mm water. An asterisk (*) appearing in the average column denotes the occurrence of measurable precipitation on one or more occasions, and that the calculated 30-year average amounts to less than a trace. The so-called climatological day, beginning at 9 a.m. standard time on the date of reference and ending at 9 a.m. the next morning, was employed in record keeping up to January 1994. On February 1, 1994, after consultation with Environment Canada, record keeping was changed to the 24-hour period of 0000 hours - 2400 hours to conform to their reporting of climatological statistics.

Total is the sum of the daily recorded precipitation. The snowfall component of precipitation is recorded as an equivalent amount of liquid water. For particulars on precipitation measurement procedures and instruments, the reader is referred to the Environment Canada publication "*Manual of Climatological Observation's*", 2nd Ed., January, 1978. The notation "T" refers to a trace of precipitation (less than 0.2 mm water equivalent). As of August 7, 1993, total precipitation was measured using the Belfort weighing gauge for the winter season and the tipping bucket during frost-free period.

SEASONS Meteorologists prefer to divide the year into four 3-month periods based primarily on temperature. Thus winter is defined as December, January, and February (DJF); spring as March, April and May (MAM); summer as June, July and August (JJA); and fall as September, October and November (SON). (Lutgens and Tarbuck, 1992)

SOIL TEMPERATURE under a short grass surface with normal snow accumulation, is measured according to procedures outlined in the Environment Canada publication "*Soil Temperature*" January 1, 1976. Depths below surface at which soil temperature measurements are made are: 5 cm, 10 cm, 20 cm, 50 cm, 100 cm, 150 cm and 300 cm. Since soil temperature is affected by profile structure and water content, extrapolation of the measured data is difficult.

SOLAR RADIATION

Diffuse - Total is radiation reaching the earth's surface after having been scattered from the direct solar beam. The instrument used is an Eppley pyranometer with a shade ring (See SOLAR RADIATION-Global- Total).

Global - Total is the sum of the direct solar and diffuse radiation during the period in question. Measurements are carried out on a horizontal surface near ground level and integrated over the whole celestial dome, summing the diffuse and direct components of the solar beam. The temperature-compensated Eppley pyranometer is used. The standard metric unit of measurement is the megajoule per square metre (MJ/m^2). (To facilitate comparison with past years' data: 1.0 MJ/m^2 = 23.895 langleys). Comparison is provided with a provisional average based on 16 years of data (1975-1990).

SPELLS - Temperature spells are defined as days when the daily maximum temperature is higher than or equal to 30°C (hot spell) or the daily minimum temperature is lower than or equal to -30°C (cold spell).

SUNRISE/SUNSET times have been included in this report. They have been acquired from the National Research Council, Canada, Herzberg Institute of Astrophysics.

TEMPERATURE

Average Annual is the average of the daily average temperatures in degrees Celsius (°C) for one year.

Average Daily is defined as the arithmetic mean of the daily maximum temperature in degrees Celsius (°C) and the daily minimum temperature in degrees Celsius (°C) for the day in question.

Average Maximum is the average of the daily maximum temperatures in degrees Celsius (°C) average over the appropriate time periods. For details concerning measurement procedures, the reader is referred to the Environment Canada publication, "*Manual of Climatological Observations*", 2nd Ed., January, 1978.

Average Minimum is the average of the daily minimum temperatures in degrees Celsius (°C) averaged over the appropriate time periods. Refer to TEMPERATURE-Average Maximum concerning measurement procedures.

Average Monthly is the average of the daily average temperatures in degrees Celsius (°C) for the month under consideration.

WIND CHILL describes a sensation, the way we feel as a result of the combined cooling effect of temperature and wind. This feeling can't be measured using an instrument, so a mathematical formula was developed in 1939 that related air temperature and wind speed to the cooling sensation. This formula was revised in 2001 by a team of scientists and medical experts from Canada and the U.S. with the Canadian Department of National Defence contributing human volunteers. The new index is based on the loss of heat from the face (Environment Canada 2001a).

WAVES - Temperature waves are defined as a sequence of three or more days when the daily maxiumum temperature is higher than or equal to 32°C (heat wave) or the daily minimum temperature is lower than or equal to ????°C (cold wave/cold snap) (Environment Canada 2005).

WIND SPEED

Average is the average of the hourly wind speeds for the period in question measured in kilometres per hour (km/h). Average hourly wind speeds are obtained from a RM Young Wind Monitor anemometer at a height of 10 m.

Peak Gust refers to the highest instantaneous value recorded by the anemometer system for the period of reference, irrespective of direction and/or duration. Comparison is with published data for Environment Canada, Saskatoon Airport station.

see also **Beaufort Wind Scale**

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